

## **Historic, archived document**

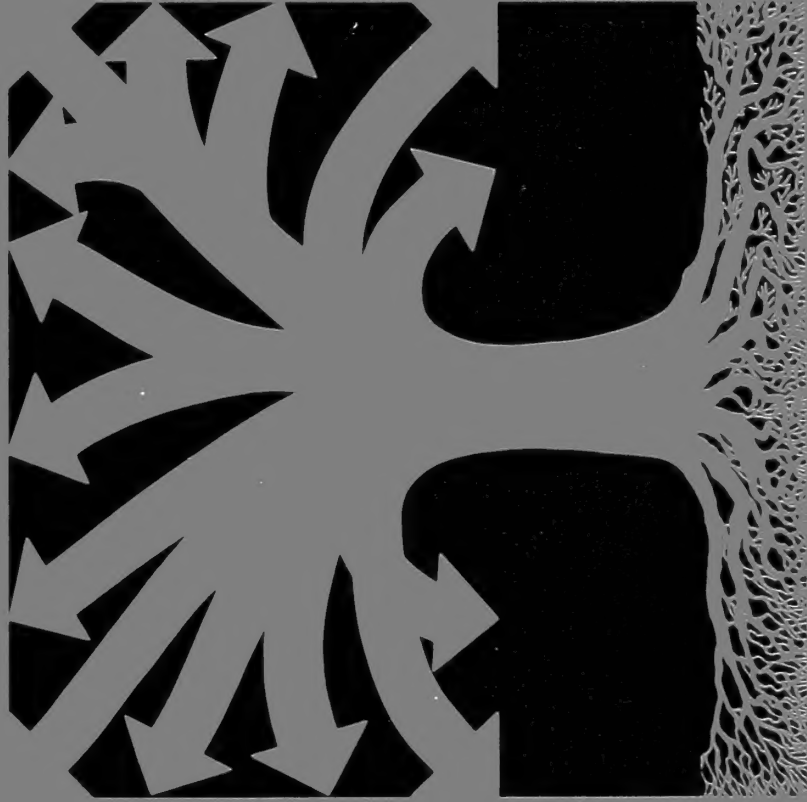
Do not assume content reflects current scientific knowledge, policies, or practices.



1978  
a Sp 11  
1152

1978 Research Accomplishments

# Learning About Forests



United States Department of Agriculture  
Forest Service  
General Technical Report WO-11





**1978 Research Accomplishments  
LEARNING ABOUT FORESTS**

## FOREWORD

One of the Forest Service's major responsibilities is to learn more and more about forests and wildlands—how to manage them and how to use them. To get the most from our forests, whether in terms of wood, wildlife, water, or wilderness, we need to continually increase our knowledge and refine our practices. We pursue these goals at eight forest and range experiment stations, strategically located throughout the country, plus a forest products laboratory. Much work is also done cooperatively with universities and other research organizations.

Highlighted here are about 40 items that show the kinds and diversity of research in progress at these facilities. Some of them merely report the progress of ongoing projects; others depict research completed and results already in use.

Many research results come in small pieces rather than large packages. Some of these pieces, although ultimately intended to fit into larger packages to help solve broad problems, are interesting and useful in themselves. And so we publish them for whatever interim benefits they may offer.

The highlights featured in the following pages are just a sampler of course, but for whetted appetites there is more. Listed at the back of this book, beginning on page 43, are all the publications issued by our entire research staff during fiscal year 1978. This list gives a picture of the variety and complexity of the problems that confront us when we set out to "manage" forest land. The list is categorized by subject to make it easier to search out a favorite topic. For further information, please contact the appropriate research headquarters directly. Their addresses are on the inside back cover.

A handwritten signature in dark ink, reading "John R. McGuire". The signature is written in a cursive, flowing style with a large initial 'J'.

JOHN R. MCGUIRE  
Chief

CONTENTS

	<i>Page</i>
Environment	
Highlights .....	1-16
Publications.....	43-62
Fire and Atmospheric Sciences	
Highlights .....	17-18
Publications.....	62-66
Insects and Diseases	
Highlights .....	19-23
Publications.....	66-84
Products and Engineering	
Highlights .....	24-29
Publications.....	84-93
Resource Economics	
Highlights .....	30-33
Publications.....	93-100
Timber Management	
Highlights .....	34-42
Publications.....	100-115



## Turning Waste Into Wood

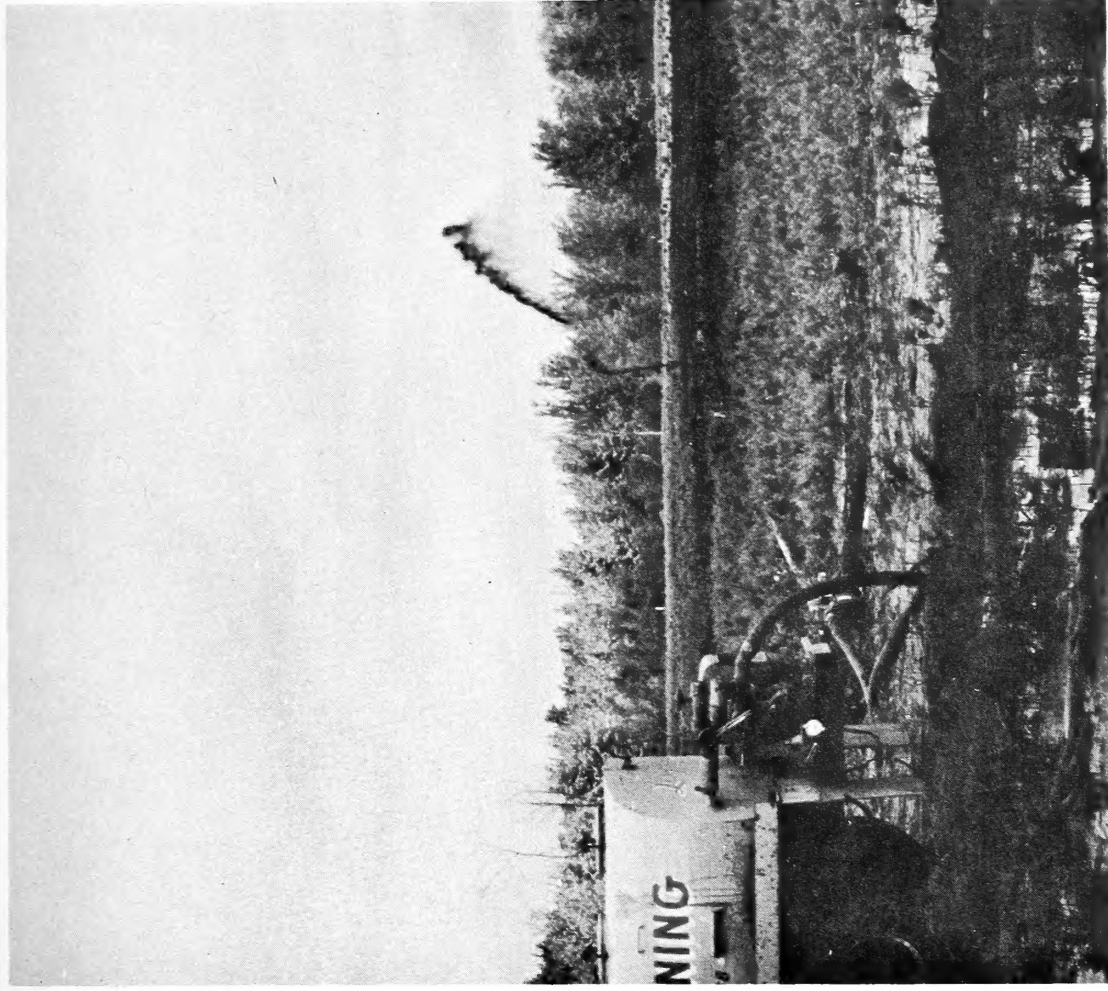
Scientists from the North Central Station are learning how to use a tree instead of a treatment in disposing of municipal sewage. They are letting Michigan's forests recycle city wastes into fiber and foliage.

In northern lower Michigan near Cadillac, researchers are spraying forest land with environmentally safe dosages of sewage sludge that fertilizes trees without releasing too many nutrients to the groundwater supply. The study has found that cost to the city is no greater than with conventional treatment methods.

Two other rural communities in the Lower Peninsula are using land treatment to dispose of their sewage effluent by irrigating and fertilizing trees.

In studies near Harbor Springs and near Middleville, researchers are examining two questions: Can the trees grow with large amounts of effluent? Can they remove the nitrogen, phosphorus, and other nutrients from the sewage? Preliminary results look promising for other communities that choose land disposal systems over treatment plants.

As the treated trees grow on these forest and cutover lands, researchers will evaluate the longrun effects of sewage effluent and sludge on water quality, timber production, and energy use.





## Sanitation in the Back Country

Disposal of human waste is one of the most critical problems for back country managers. The problem is compounded because many campsites are located at high elevations where the soil is shallow and because use has increased so much that 10 to 20 visitors per night may use the same facilities.

Frequent relocation of latrines is a short-term solution at best. A standard latrine requires a hole at least 4 feet deep and hence the number of possible sites is limited.

Researchers at the Northeastern Station have done much to solve this problem by using waste composting methods. A simple bin was developed to compost human wastes mixed with ground bark. The decomposition process takes about 2 weeks in the closed container and the compost pile reaches temperatures above 60° C. The bin can be maintained easily by regular field crews and the end product is a humus-like substance, environmentally safe and odor free. Because the process is contained in the bin, soil depth is no longer a problem. Cost of a unit is about \$100. One such bin can process the waste of more than 1,500 people per year at a total cost of about \$250.

## Water Quality in the Northern Rocky Mountains

What happens to water in the mountains affects its use on the plains. So the place to begin protecting our water supply is at its source. Congress recognized this in 1972 when it amended the Federal Water Pollution Control Act to require that pollution control "... be planned and managed through an integrated, areawide, wastewater treatment plan." This direction posed a problem in the northern Rocky Mountains, where little is known about basic water quality relations.

To help meet the mandate, the Intermountain Station and the Environmental Protection Agency began to investigate the quality relations of water that originates in the forests of the northern Rockies. Researchers established study areas in river basins near Glacier, Yellowstone, and Grand Teton National Parks. Streamflow, suspended sediment, and dissolved elements were analyzed and correlated with watershed geology and other physiographic characteristics.

The researchers developed water quality rating curves and other predictive relations between basic geology and water quality. The Environmental Protection Agency and local planners now use this information in the planning process.

The information was also used to develop a model—the Water Quality Benchmark System—now being adopted by the Northern Region of the Forest Service. The system shows high potential for helping integrate water quality considerations into land management planning.







## How Much Pollution Is “Normal” for Forest Water?

To establish water quality standards for forest land, we need to know how much water pollution is “normal.” Otherwise, standards may be so strict that conducting forestry operations would be impossible.

For example, Southern Station scientists have examined water from undisturbed pine-forested watersheds and found that the level of phosphorus in solution is near that suggested by the EPA as the maximum allowable. Phosphorus in suspended sediment accounted for two-thirds of the total annual phosphorus yield. This finding emphasizes the importance of minimizing sediment yield to protect water quality.

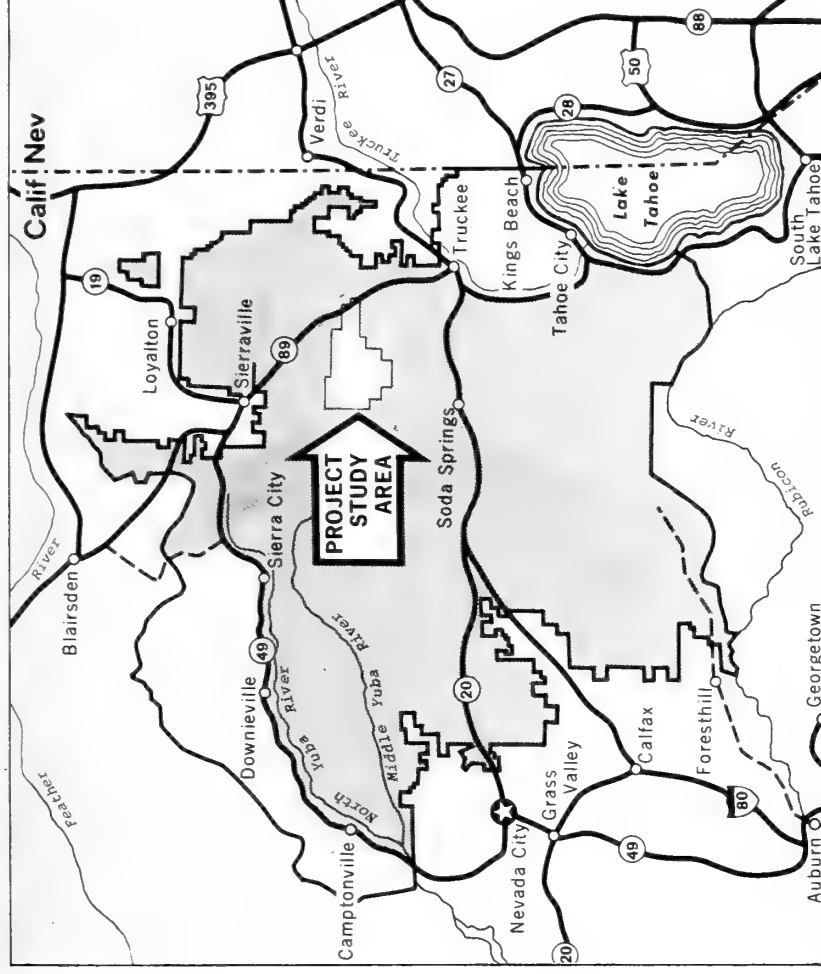
So far, scientists have determined that sediment concentrations average about 0.007 tons per acre-inch of flow from planted loblolly pine and mature natural shortleaf pine-hardwood stands in the upper Coastal Plain of Mississippi. Concentrations from individual storms may be 10 times or more higher, due largely to flushing of sediment accumulated in channels—a phenomenon that may be unrelated to forestry operations. Recently, the Southern Station, universities, and forest industry began a project to find base levels of pollution for other geographic areas of the Coastal Plain.



## A New Approach to Environmental Assessment

Researchers at the Pacific Southwest Station have developed a new computer-assisted system that will aid forest and range managers with the difficult task of assessing the impact of various land treatments on the environment. Called IMPACT, the system consists of (1) an information base built around a complex network of social, economic, and natural environmental conditions linked together in cause-and-effect relations commonly associated with management activities; and (2) a computer program that resource managers and specialists can use to search this information base. It combines the speed, memory, and thoroughness of the computer with the professional skills, local knowledge, and judgment of the user in assessing environmental impact in land-use planning.

In its development stages, IMPACT was tested on actual land-use problems on the Tahoe National Forest in California and in a six-State area in the Rocky Mountains and Great Plains. It is currently being used by planning units in both the Forest Service and the Bureau of Land Management throughout the United States.





## Environmental Effects of Weather Modification

Weather modification, generally cloud seeding, is being used in California and other Western States to increase water supplies. Its widespread use has been hindered, however, because little is known about the environmental effects of increasing or extending the snowpack.

Because it is difficult or impossible to measure the ecological effects of weather modification by conventional monitoring methods, scientists at the Pacific Southwest Station analyzed long-term records of precipitation, temperature, and snowpack and developed simulations for various aspects, covers, and climatic regimes. The simulations were used as a basis for evaluating the impact of weather modification.

The analyses and evaluations showed that, although weather modification can increase long-term average precipitation 10 to 15 percent, the increase is not expected to cause significant ecological changes. The work also resulted in a method for scheduling and monitoring early season cloud seeding to prevent development of abnormally large snowpacks in unusually wet years.

## Snow Control Research Yields Useful By-Product

Sometimes research produces fringe benefits far afield from its original intent. Here are a couple of examples from the Rocky Mountain Station's snow control project.

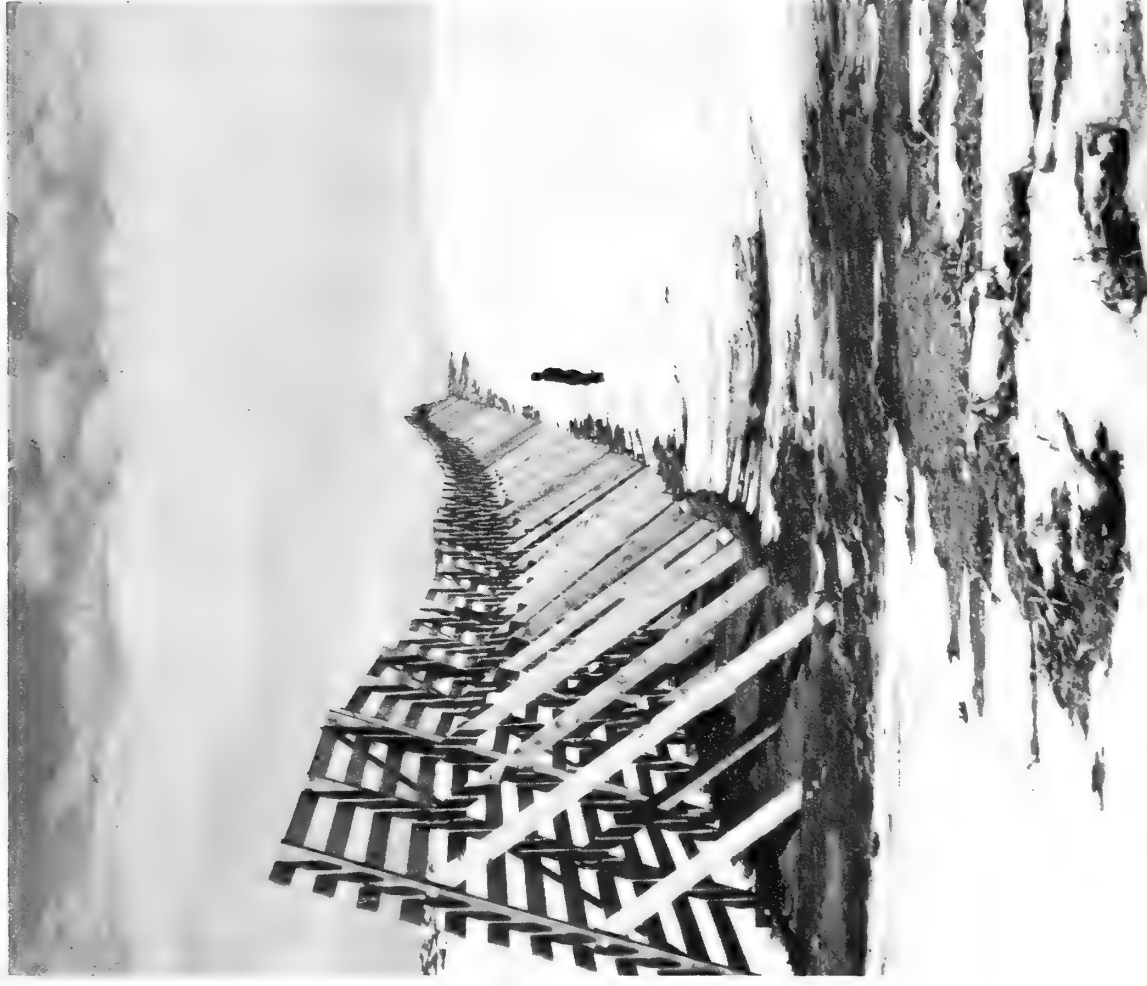
Blowing snow often makes winter driving hazardous over most of the northern United States. Forest Service scientists in Wyoming and Colorado, however, have engineered systems to take much of the sting out of blowing snow in critical areas.

Scientifically designed and placed snow fences up to 12 feet tall are highly effective for trapping snow in drifts away from highways, improving visibility, and reducing road ice. A \$2-million, 21-mile snow fence system designed by the Forest Service for the Wyoming Highway Department has reduced accidents up to 50 percent and highway closure time up to 80 percent along a drift-prone stretch on Interstate Highway 80. A similar system is being constructed to protect Alaska's North Slope oil pipelines.

The Wyoming Highway Department also uses a computerized Forest Service "drift profile prediction model" for earthwork design, so that highways can be engineered to be drift-free.

These applications of snow control research, originally intended for avalanche control and water yield in the high Rockies, will significantly reduce highway snow removal costs, help conserve fuel, prevent deterioration of pavement caused by moisture penetration, and increase highway safety.

Related research led to an instrument for measuring visibility in blowing snow. Station scientists applied recent discoveries in snow transport physics when designing a computerized system to analyze and interpret these data, make traffic operation decisions, and advise motorists by means of variable-message signs. The system is being used on I-80 in Wyoming.





## Intensive Management Pays Off for California Deer Herd

Like deer throughout California, the North Kings herd of the central Sierra Nevada has steadily declined in recent years—down from an estimated 17,000 in 1954 to a low of about 3,500. However, as a result of an intensive cooperative research and management program, a concept of total management is being developed and implemented for this herd in an effort to restore its numbers.

Under the integrated program, cosponsored by the Pacific Southwest Station and a diverse group including a sportsmen club and State and Federal agencies, the type and proportion of needed forage have been determined, new forage species have been introduced, and fertilization trials have improved quantity and nutrition of herbaceous vegetation.

More than 10,000 acres of deer range have been treated in some 30 different management projects, ranging from seeding to prescribed burning. Some of the treatments so enhanced vegetation that deer use increased five-fold. In one prescribed burning treatment, mountain whitehorn, a favored browse species, increased from 28 to 560 plants per acre, and the range is continuing to improve.

The techniques for improving habitat have been coordinated with timber harvesting, watershed management, and fire management. While all the answers are not yet known, the herd is expanding.

So far, the coordinated management techniques have resulted in improved habitat, increased browse with higher nutritional values at critical stages, total increase in the herd, improved age distribution, and increased fawn survival.

## Ask "RUN WILD" for Information About Wildlife Needs

How does harvesting forest trees, building a dam, or establishing a recreation area affect wildlife? Research has developed many bits and pieces of valuable information about individual species, but frequently managers have difficulty assembling these fragments to solve specific problems.

To help managers collect such information, Rocky Mountain Station wildlife researchers designed a computerized information storage and retrieval system. Called "RUN WILD," the system contains information on wildlife species distribution, protection status, and key food and cover requirements.

The system can provide three types of information. First, RUN WILD provides basic information, such as lists of mammals, birds, fish, reptiles, or amphibians in an area. It can also provide more detailed information about specific food or cover requirements of individual species. Finally, the manager can ask RUN WILD for specific management information and literature references for particular species likely to be affected by his actions.

Current documentation for the Southwest consists of over 3,000 references on 324 birds, 159 mammals, 105 fish, 105 reptiles, and 27 amphibians. The system is now being readied for adoption in other parts of the country.







## Wildlife and Timber: Peaceful Coexistence

Forests managed primarily for timber can also sustain much wildlife, but only if the animals are favored by timber management prescriptions. For example:

- Trees grown in open stands have well-developed crowns and produce more fruit than trees grown in dense stands.
- Understory plants growing in light to moderate shade begin fruiting younger and produce fruit more consistently than plants in deep shade.
- Tree age affects productivity: Trees in the middle of their lifespan produce more fruit than either young or old trees.
- Prescribed burning increases fruit production of many understory species but may destroy other species or seriously reduce their capacity to produce fruit.
- Genetically superior trees may grow 20 or 30 percent faster than unimproved trees, and it is likely that fruit production can be increased correspondingly.

The variety of fruits is as important to wildlife as the abundance. When many kinds of plants are present, fruits are likely to be available year-round, stands will produce fruits consistently year after year, and the habitat will meet the needs of many wildlife species. A variety of fruit also offers animals a balanced diet, especially in the South, where many forages are deficient in nutrients during several months of the year.

A recent publication of the Southern Station describes and illustrates 106 woody plant species that produce fruit useful to wildlife in southern forests. More important, it gives information about plant growth requirements, management, and nutritional quality. Trees, shrubs, and vines that produce fleshy fruit or nuts are emphasized because their fruits are a vital source of food for many animals and birds.

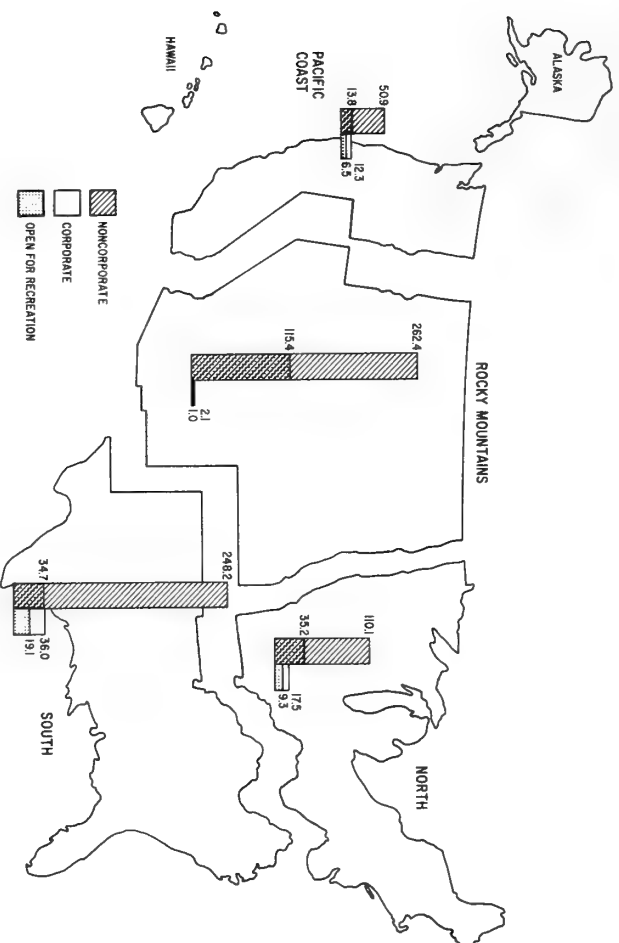
## Stomach Pump for Fish

In the past, a fish had to be killed before the contents of its stomach could be examined. And because what fish eat is important to fisheries experts, as well as to fishermen, extensive research projects were wasteful—not to mention being hard on fish. So an Oregon State University researcher developed a technique for sampling the stomach contents of young fish without harming the fish. The method has been thoroughly tested by Forest Service scientists and found to be effective.

The system is much like having your stomach pumped out. A blunt, hollow needle is inserted through the mouth of the fish and into its stomach. Water is forced gently into the stomach and the contents are flushed back into a collecting jar. Thus relieved of its latest meal, the fish swims away unharmed. And the researchers have their sample.

During the past 3 years, Forest Service researchers tested the technique on three salmonids—coho salmon, cutthroat trout, and rainbow (steelhead) trout—and found it to be quite harmless to fish.





Acreage of privately owned forest and range land and amount open to public recreation.

## Private Land for Public Recreation

What part does—and could—private land play in providing facilities for public recreation? The question is important in view of the increasing demand for recreational sites and the large amount of privately owned forest and range land.

The Southeastern Station conducted a nationwide survey of forest and range landowners to determine the amount of private land that is open to public recreation and the attitudes of landowners toward such use.

More than half the corporate forest and range land in the United States is open to public recreation, and almost one-third of that owned by individuals and families is similarly open. A major reason given by corporations for allowing public use is to improve public relations. Many noncorporate owners cited difficulties in posting their land. Many of those who allow public recreation encounter problems such as littering, garbage dumping, fire, vandalism, crop damage, equipment theft, illegal hunting or fishing, and intrusions on owner privacy.

More than half the owners of closed land said that they would not allow public recreation under any circumstances. However, others said that reasonable profit, protection from lawsuits, and tax incentives would induce them to change their minds.

The survey concludes that a large amount of private land is available for public recreation. East of the Mississippi River, this acreage far exceeds that of public land.



## Who Skis—and Why

Skiing popularity has snowballed throughout the country during the past decade. Although the economics of the skier market has been evaluated locally, no nationwide survey of this growing business was made until recently when a cooperative study was conducted by the Northeastern Station, the Washington Office Resource Program and Assessment staff, and Cornell University.

This first comprehensive look at what has become a major outdoor recreation market included regional descriptions of present skiers, former skiers, and people who plan to take up skiing in the future. A telephone survey provided data from 2,191 potential, active, and inactive skiers.

The study also provides detailed information on the public attitudes towards skiing, its costs, attractions, facilities, and market needs. Planners and developers of skiing facilities now have an objective estimate of the skier market's potential for short-term growth, both regionally and nationally. They will also be able to assess the adequacy of current skiing facilities.





## Following the Nutrient Cycle

Most of the benefits a forest provides depend upon the productivity of the soil. So, if a forest soil is being depleted, land managers need to know it and to change their ways before the production of benefits starts to decline. Studies of nutrient cycling are designed to provide the necessary early warnings about soil depletion. Much of the research on nutrient cycling in forests is being done by the Northeastern Station in cooperation with Yale and Cornell Universities and by the Southeastern Station in cooperation with the University of Georgia.

The studies are conducted on watersheds that have been instrumented to measure the amount of water leaving and its mineral content. Over long periods, the effects of various forest management practices on water production and quality have been measured. Now, the effects of management practices on mineral cycling are being measured on the same watersheds.

Of particular interest currently is the increased drain caused by whole-tree logging—the harvest of stumps, small limbs, and leaves along with main stems. Loggers have traditionally left such materials in the woods, and the nutrients in them have returned to the soil. We need to know how seriously whole-tree logging will upset this cycle, hence the intensified research effort.

## Immigrant Pine Proves Blight Resistant

Austrian pine has long been used for landscape planting and, because of its hardiness and growth form, in shelterbelts to protect people, crops, soils, and wildlife from the harsh environment of the Great Plains. However, a devastating needle blight, caused by the fungus *Dothistroma pini*, kills many trees.

In an effort to discover faster growing, disease resistant strains of Austrian pine, Rocky Mountain Station scientists in eastern Nebraska established plantations in 1962 from seeds collected in Europe throughout the natural range of the species.

Although many sources produced some trees highly resistant to *Dothistroma* blight, a Yugoslavian source was consistently better than others—much better than sources traditionally used to grow seedlings for distribution in the United States.

Young trees from the Yugoslavian seed source are now being mass-produced in “seed orchards” for wide-spread planting in shelterbelts and urban areas.





Before and after sediment removal.



## Research Contributes to Land-Use Plan

Based primarily on the strength of research results, timber harvesting will resume on the slopes of the South Fork of the Salmon River. A long-term research program in the Idaho "Batholith" (an area characterized by steep slopes and highly erodible soils) contributed directly to a Boise National Forest land-use plan. The plan calls for an average annual timber cut of nearly 8 million board feet for 5 years, followed by an increase to about 12 million board feet per year. The timber cut will depend on continued favorable fishery conditions in the river.

The South Fork of the Salmon, a key spawning stream for anadromous fish, is typical of the Idaho Batholith. Intensive logging and road construction followed by severe storms (in 1964 and 1965) caused extreme sediment deposition that filled resting pools and buried many fish spawning beds. So the Forest Service declared a moratorium on all timber sales and road construction in the South Fork.

The Intermountain Station then accelerated research to help improve conditions in the South Fork and to provide for better management of all Batholith land. Studies over a 15-year period determined erosion and sediment impacts of logging and road construction and developed erosion control practices. Guided by these results, scientists worked closely with National Forest personnel to develop a land-use plan for the South Fork. The research used in developing the South Fork plan is also being applied in other National Forests in Idaho.



## Preventing Fires Where City and Wildland Meet

In southern California, one of the worst fire hazards occurs where cities and towns encroach on forests, chaparral, and brushland. Wildland fires have increased five-fold in southern California in the past 10 years, and one out of five start where city and wildland meet.

Because of the explosive nature of these fires, preventing them is a lot surer than trying to suppress them once they start. So, the Pacific Southwest Station is coordinating the research for a unique cooperative effort to analyze the fire problem, and to design, evaluate, and implement cooperative prevention programs in such locations. Cooperators include: the National Fire Prevention and Control Administration, and the Bureau of Census, U.S. Department of Commerce; the California State Department of Forestry; the University of California at Riverside; the city and county of San Bernardino; and the San Bernardino National Forest.

Station researchers have developed "spatial risk maps" that pinpoint the mathematical probability that a fire will start in a given place at a given time for each 40-acre compartment in a 110,000-acre study area, extending from the city of San Bernardino through the San Bernardino National Forest to the high desert country to the east.

The researchers have also modified Census Bureau computer programs to provide a standardized data base for all important fire and fire prevention information for National Forest, State, county, and city land. This is the first time census information has been used for this purpose.

The cooperative project is the first of its kind in the United States and is already serving as a model for other communities where urban growth is bringing the wildfire problem closer to the city.



## Better Use of Fire Retardants

Air tankers loaded with fire-retardant chemicals are the key to fast, efficient forest and range fire control. Fire control agencies in the United States use about 29 million gallons of retardants each year in air tanker operations. Retardant costs exceed \$5 million a year and their delivery and application add another \$20 million to the bill.

Significant savings can be realized by increasing retardant chemical effectiveness, improving methods of delivery and application, and refining strategy and tactics. At the same time, detrimental impacts on the environment resulting from retardant drops must be minimized.

Researchers at the Intermountain Station strive to provide fire managers with systems and guidelines to improve the performance of air tanker operations. Consideration is given to the effectiveness, physical properties, delivery systems, and environmental impact of fire retardants. A computer model has been developed that helps assess the fire control value of various retardant characteristics. Field tests measure retardant distribution and concentration at different heights and speeds. An experimental tank system (designed for the study) tests release of the retardants.

Research efforts have produced air tanker guidelines for use in selecting the specific air tanker most effective for local fire-fuel situations. The guides also enable the managers to evaluate the performance of individual tankers. In addition, the researchers have devised methods to prevent corrosion in retardant mixing and delivery systems.



## Protecting Seed Orchards From Insects

More and more tree plantations are being established from genetically improved seed produced in seed orchards. Like all "farm" crops, pine seeds have enemies, particularly insects.

So, like the farmer, a seed orchard manager must find ways to protect his crop, while producing a minimum of environmental side effects. Forest Service entomologists have developed a procedure called **cone analysis** to help.

A few years ago, production in some southern pine seed orchards was so low that the Southeastern Station was asked to find the cause and develop a cure. Several species of insects were identified as the culprits, and insecticide treatments were developed to control them. But all of the troublesome insects are not present in all seed orchards. To decide whether treatment is necessary, the orchard manager needs to know what insects are attacking and how much damage they are causing. Without this information, he must protect against all insects, including the ones that are not there.

Systematic analysis of cones and seeds provides the needed information. Details about the procedure are contained in a recent Southeastern Station publication. By following the recommendations, a manager can evaluate his orchard and decide what insecticide treatments are necessary.





### **Western Forest Insect Book Published**

A newly published reference book will help practicing foresters recognize forest insects and the damage they cause. Nearly 1,400 species of insects and related organisms are described in the 654-page book, *Western Forest Insects*, USDA Miscellaneous Publication No. 1339.

Described are insects found on trees, shrubs, and wood products in North America west of the 100th meridian and north of Mexico. Most of these species are harmless or innocuous. But 31 are considered major pests, and a number of others are occasional pests. The book has two primary indexes and background chapters on the role, natural regulation, habitat relations, and control of insects.



## Guide for Managing Sycamore Pests

Throughout the South, sycamores are important in natural stands and are often cultured in plantations. They also are widely planted as attractive, fast-growing ornamentals. But insects, diseases, and pollutants take a heavy toll of sycamores. Although these pests kill few trees, they reduce growth, mar the beauty of the trees, and degrade lumber.

Researchers at the Southern Station and pest management specialists of the Southeastern Area, State and Private Forestry, have assembled a booklet of the latest information on 31 species of insects and diseases and 4 air pollutants that commonly damage sycamores. The 36-page, color-illustrated publication includes guides for identifying the pests and the damage they inflict. It gives preventive measures, cultural practices, EPA-registered chemicals, and harvesting techniques that can be used for control. Particular attention is paid to natural enemies that can help control outbreaks of insects.





## **Breeding for Rust Resistance**

Fusiform rust is the most serious disease in southern forests. It attacks young pines, particularly those in plantations, and the only promising method for controlling the disease is by breeding resistant trees. Recent findings at the Southeastern Station indicate that this breeding will be a continuing task, as it is with grains.

Plant breeders are constantly developing new strains of wheat to keep ahead of wheat rust. They must do so because the fungus is highly variable and develops the ability to infect previously resistant strains. It appears that the same sorts of programs will be required to control fusiform rust in forest plantations.

Many studies have demonstrated that loblolly pines, the most popular trees for reforestation in the South, vary widely in their resistance to fusiform rust infection. Some of the most resistant trees have been cross-pollinated, and their progeny are being included in tree breeding programs. A recent study shows, however, that different strains of the rust fungus vary widely in their ability to infect loblolly pines. Even the most resistant pines are highly susceptible to infection by some forms of the rust.

According to pathologists who did the research, the findings are neither surprising nor depressing. Although breeding for resistance on a one-time basis would have been convenient, the technology for locating resistant pines and crossing them with trees containing other desirable traits has been developed.

## Quick Action Saves Money—and Elms

Researchers at the Northeastern Station have shown that losses of trees to Dutch elm disease can be reduced by early identification and removal of diseased trees. This is good news for municipal arborists in particular, and for city and town dwellers in general.

In a recent trial, disease surveys during the summer months were tripled in parts of the Northeast. The affected trees were removed within 20 working days after detection of the disease, instead of waiting to remove them during the fall and winter months. This intensified effort reduced the incidence of Dutch elm disease by 1.2 percent the first year, 2.4 percent the second year, and 6.7 percent the third year.

Cost of this program was twice that of the conventional survey program, but tree removal cost was only three-fourths that for the usual treatment. So the net result over a 3-year period was a dollar savings to the taxpayers of about 25 percent. More importantly perhaps, the program saved an additional 92 trees per thousand in the elm population to maintain the beauty of the neighborhoods.





## **Solar Power for Drying Wood**

The sun provides energy for growing plants, heating homes, and now, for drying lumber.

Harnessing the sun's power, scientists from two Forest Service research units have designed solar wood dryers at promising savings in cost and energy use. Because drying consumes 60–70 percent of the energy required for manufacturing lumber, using the sun can greatly reduce the need for fossil fuels.

Researchers of the North Central Station have built a solar dry kiln, using recycled beverage cans in the solar collector. They found that solar drying takes half the time and produces better quality lumber than does conventional air drying.

Scientists from the Forest Products Laboratory have developed a low-cost solar kiln for tropical countries such as the Philippines. Their kiln costs less than \$6,000 and can dry 4,000 board feet a month. Built into the ground, the kiln's solar collector is separate from the heavily insulated drying chamber. This unique design permits a larger collector for less cost.

## Wood Products From Wood Fuels

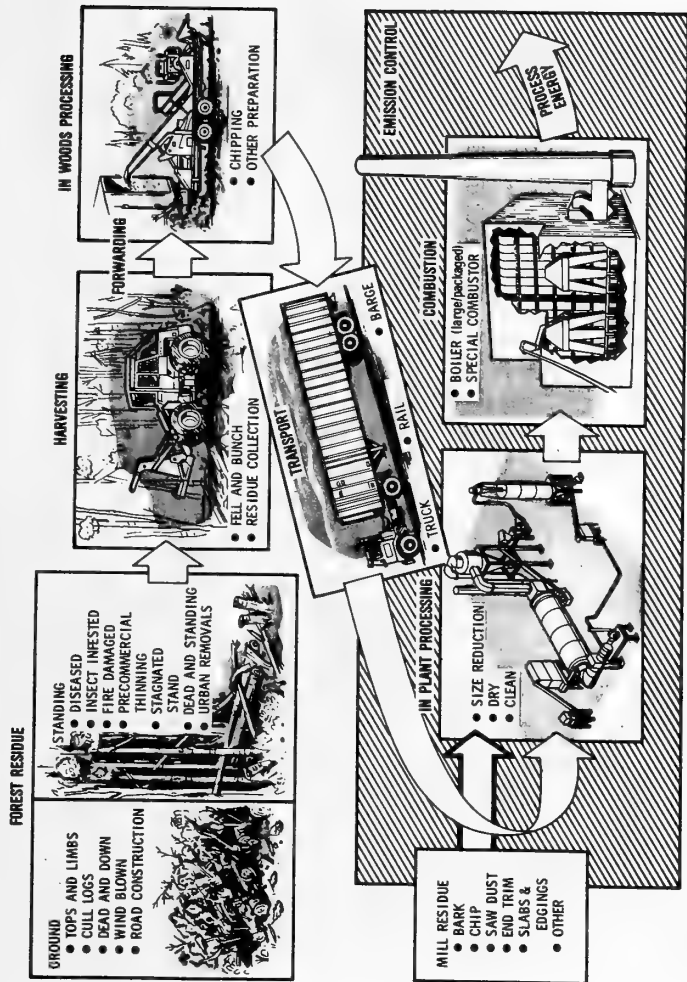
Picture this: On the northern shore of Lake Michigan, a mill produces paper each day, its energy needs supplied by wood wastes from logging and manufacturing and from rough and rotten trees, tops, and limbs. The mill no longer needs the coal, oil, or gas that once fired its boilers and kilns; it now uses wood residues exclusively for fuel.

Pie-in-the-sky theory? A forester's dream? No—the above scene could be real in just a few years.

North Central Station scientists studied the pulp and paper industry in Michigan's Upper Peninsula and in northern Wisconsin to see if use of wood residues could make energy independence possible. They found that 9 out of the 10 major mills within the area could become energy self-sufficient with forest-residue fuels in the 1980's.

Although pulp and paper mills already burn some wood for fuel, they must now buy most of the energy they need. The mills consume a big chunk of the energy bought by forest industries, the fourth largest consumer of purchased energy.

From this research and earlier studies, scientists have concluded that using forest residues as an energy source can have national impact in solving the forest industry's energy needs.





## Moving Wood Chips by Pipeline

More complete and efficient utilization of forest and mill residues is often hampered and sometimes prohibited by the high cost of transporting wood chips.

To help alleviate this problem, researchers at the Intermountain Station and Montana State University have developed a system for transporting wood chips by hydraulic pipeline. The research took into account design and performance of pumps, injection systems, metering and flow-controlling devices, and other components of an operating pipeline. Results show that use of the pipeline system can cut transport cost in half.

The system can move chips from sawmills and plywood mills, where the chips are a byproduct, to a pulpmill or port. Other promising applications include moving chipped wood from chipping operations in remote forest areas where roads are inadequate. In areas where the chips could be transported by pipeline to a lower location, as in most western forest operations, the system operates by gravity flow, without conventional energy sources.

The hydraulic pipeline concept can be applied widely, regardless of distance, terrain, or weather. The concept is also energy efficient—pipeline transportation uses approximately one-eighth the energy required to move the same pulp tonnage by truck.

The hydraulic pipeline has drawn the interest of wood-based industries both in the United States and abroad.



Prototype hydraulic wood chip pipeline.

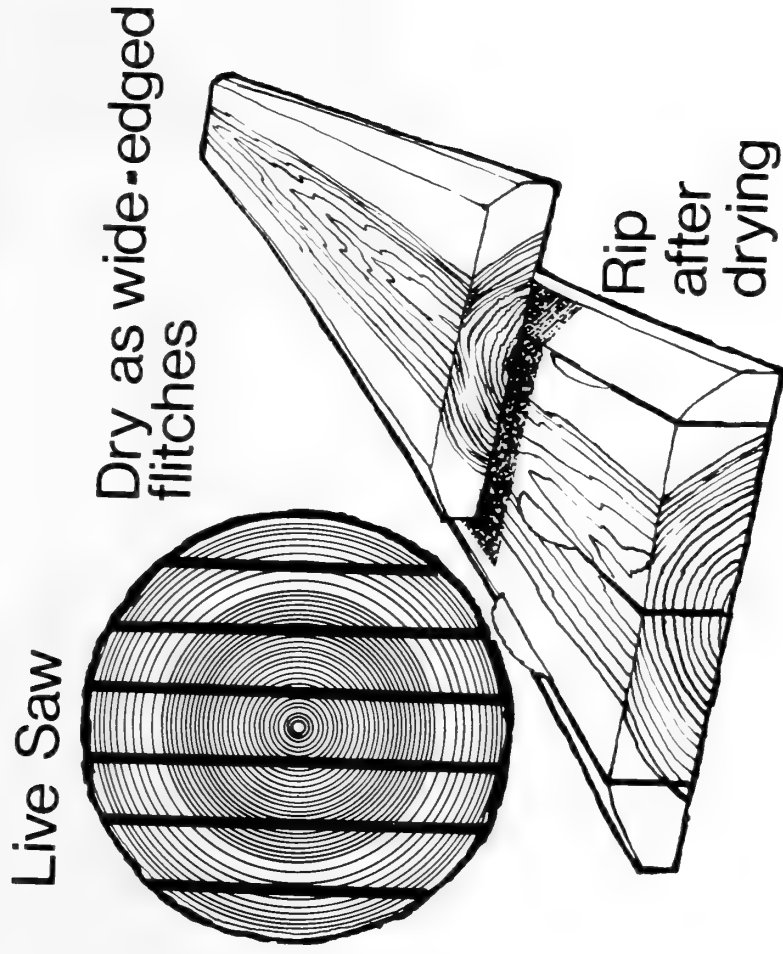
## Preventing Warp in Yellow-Poplar Studs

Yellow-poplar, underutilized in recent years, is now showing a surplus of small sawlogs. Although the species is ideally suited for studs because of its strength, small knots, and good nailing qualities, it has one serious fault: when sawed the conventional way, it warps badly.

Researchers at the Forest Products Laboratory have developed a processing system for hardwoods such as yellow-poplar that solves the warping problem. Dubbed the SDR (saw, dry, and rip) concept, the system utilizes old techniques, but in new ways.

SDR involves sawing logs into wide timbers (flitches), drying the flitches at high temperature (over 212° F), then ripping them into studs. More than 99 percent of the studs so manufactured met requirements for stud grade.

Initial research using yellow-poplar has shown a nearly 90-percent reduction in crook (the most critical warp factor) over conventionally sawn and dried studs. Utilizing yellow-poplar for studs can help to balance supply and demand for this species, reduce the current heavy drain on the softwood crop, and reduce the energy needs for transporting softwoods from West to East.





## New Wood Products Pass User Test

Forest Service research helps in the development of wood products that will best utilize the Nation's forest resources. COM-PLY, developed at the Southeastern Station, and PRESS-LAM, developed at the Forest Products Laboratory, are examples of recent successes. In the last year, both received the sternest test of a new product—use in practical situations. Both passed with high grades.

COM-PLY panels, studs, and joists were developed for building construction with the idea of extending the Nation's wood supply. Almost all the wood in a typical southern pine stand can be used in the manufacture of these products, whereas only about half the wood can be converted into conventional lumber and plywood. Research had shown that COM-PLY products—"sandwich" materials consisting of plywood and particleboard—are structurally safe, durable, dimensionally stable, and economical to manufacture. The question was whether building contractors would like them.

In 1978, a COM-PLY demonstration house was constructed near Atlanta to introduce the new products to builders in the Southeast. The people who built the house were particularly pleased with the straightness of COM-PLY studs and joists, and with the availability of extra long joists. They reported less waste and greater dimensional stability after heavy rains soaked the partially completed house.

Meanwhile, PRESS-LAM bridge stringers and decking are proving their value each day as cars and trucks cross Stony Creek in the George Washington National Forest in Virginia. PRESS-LAM products are made by gluing together sheets of veneer made from low-quality logs. They can be produced as long and as thick as necessary, and are far stronger than solid wood components of similar size.



PRESS-LAM is strong, fairly low in cost, and easily treated with preservatives—ideal for bridge components. The market for such material could be large: The Federal Highway Administration estimates that more than 100,000 small bridges currently need replacing in the United States alone.

## Way Paved for Greater Utilization of Tropical Forests

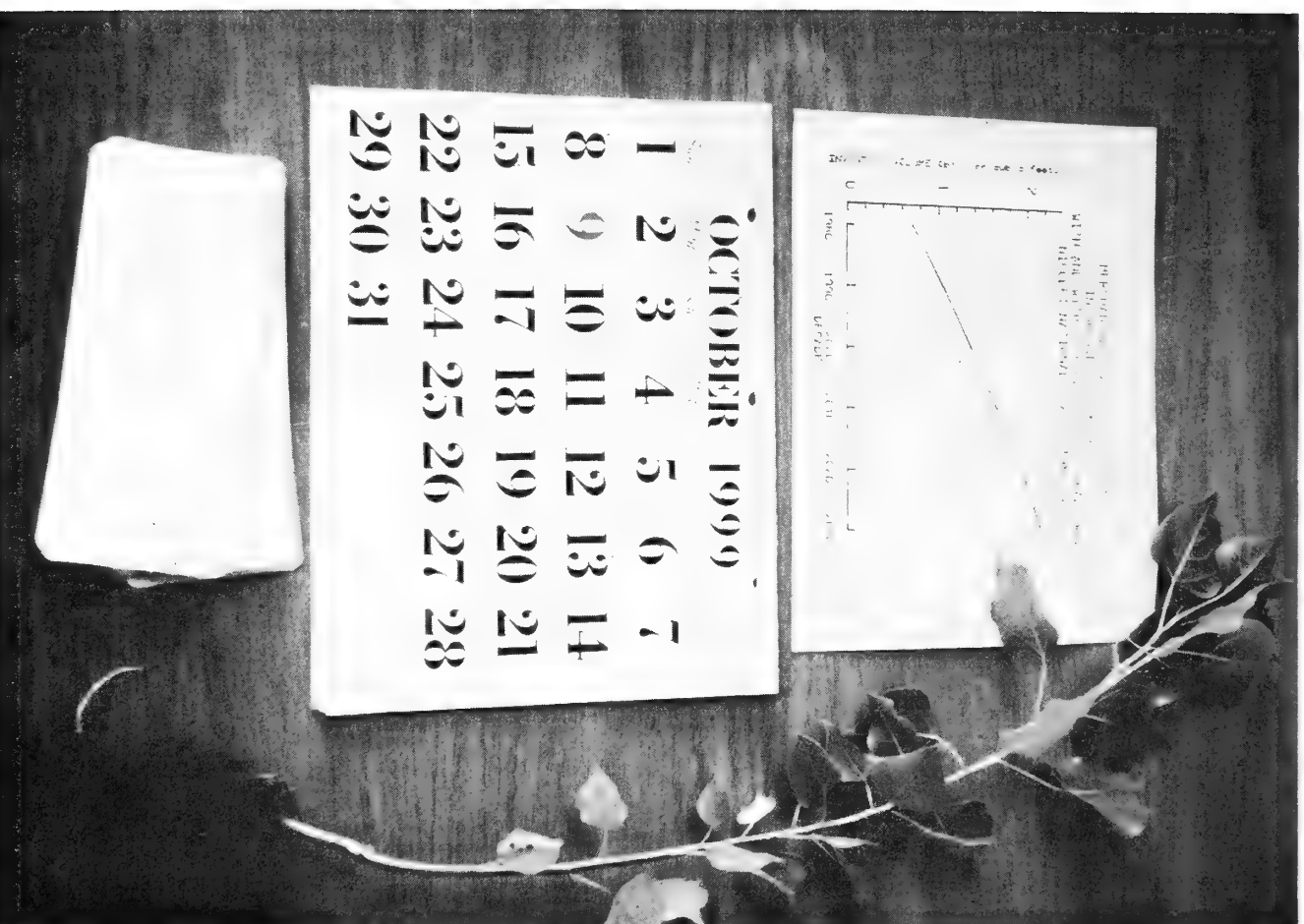
Segregation of tropical species is not necessary for manufacture of a wide range of wood-based products including hardboards, particleboards, and paper. All these products were made successfully at the Forest Products Laboratory from run-of-the-woods mixtures of species obtained from three different tropical areas of the world.

Advantages to using mixed tropical species are great. In the source countries, new jobs and higher living standards could result. In this country, because more forest products would be available, the balance of payments might benefit from lower prices.

The research, carried on in cooperation with the Agency for International Development, showed also that the tropical woods require less energy to process than do native species used for hardboard production. And finally, using all species of trees that the land produces permits leaving more of the forest in its natural state.

Current market prices do not warrant establishing a new pulpmill to produce kraft paper from mixed tropical hardwoods at this time. However, economists believe that by 1990 demand in Japan and Western Europe could create a market for imported tropical pulps. Certainly, as populations grow and the resource base shrinks, more complete utilization of tropical forests will occur.





## Computerized Crystal Ball

Foresters are always talking to themselves: What would happen if...? How can we be sure that...? Their problem is that they are dealing with nature's most long-lived organisms—trees—and so their decisions must reach a long way into the future. They're getting some new help now, though, from that seemingly universal tool—the computer.

Scientists at the North Central Station have developed a computer system that predicts tree growth in Lake States forests. Using data from a sample plot of trees, growth projections over 5, 10, even 100 years can be made for different silvicultural treatments and conditions.

Forest managers can now estimate the volume of timber that would be available under various management strategies for the next few decades. They can evaluate responses to thinning, harvest cutting, and other cultural treatments.

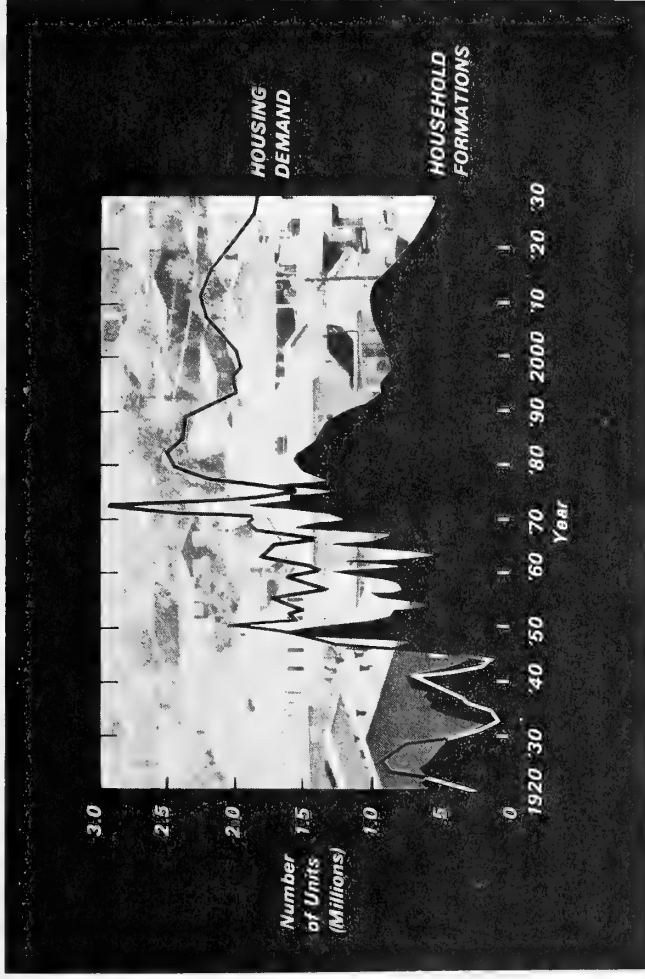
Researchers are now working to adapt this system to other regions of the country.

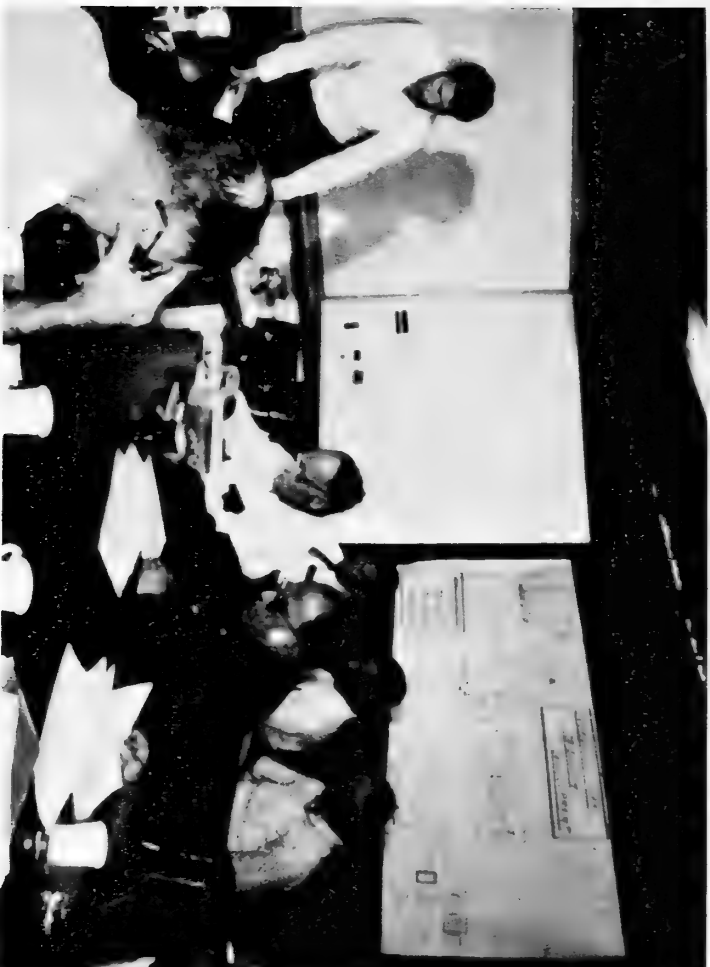
## Housing Demand Projected

Housing demand will remain strong throughout the 1980's if economic growth continues, according to a projection model developed by researchers at the Forest Products Laboratory. After 1990, however, housing demand will moderate because of declining population growth. Demand for single-family housing will continue because of a predominantly middle-aged population. Shifts in population to the South and West are likely to continue, disproportionately increasing demand in these regions.

The model is proving especially helpful in estimating future timber requirements for the 1980 Resources Planning Act assessment and for use in planning by public and private businesses. The model was used by Oak Ridge National Laboratory to help develop a national residential energy-use model.

Projections of housing demand by type of unit and region to the year 2020 were published. These projections have been republished in part by several private groups. They have also formed the basis for estimating rural housing demand to 1985.





## **Help for Land-Use Planners**

Local forest and rangeland planning will be a major challenge for public land managers in the years ahead. Congress has directed the public land management agencies to improve their planning processes, and to provide better opportunities for interested citizens to help resource managers make wise decisions.

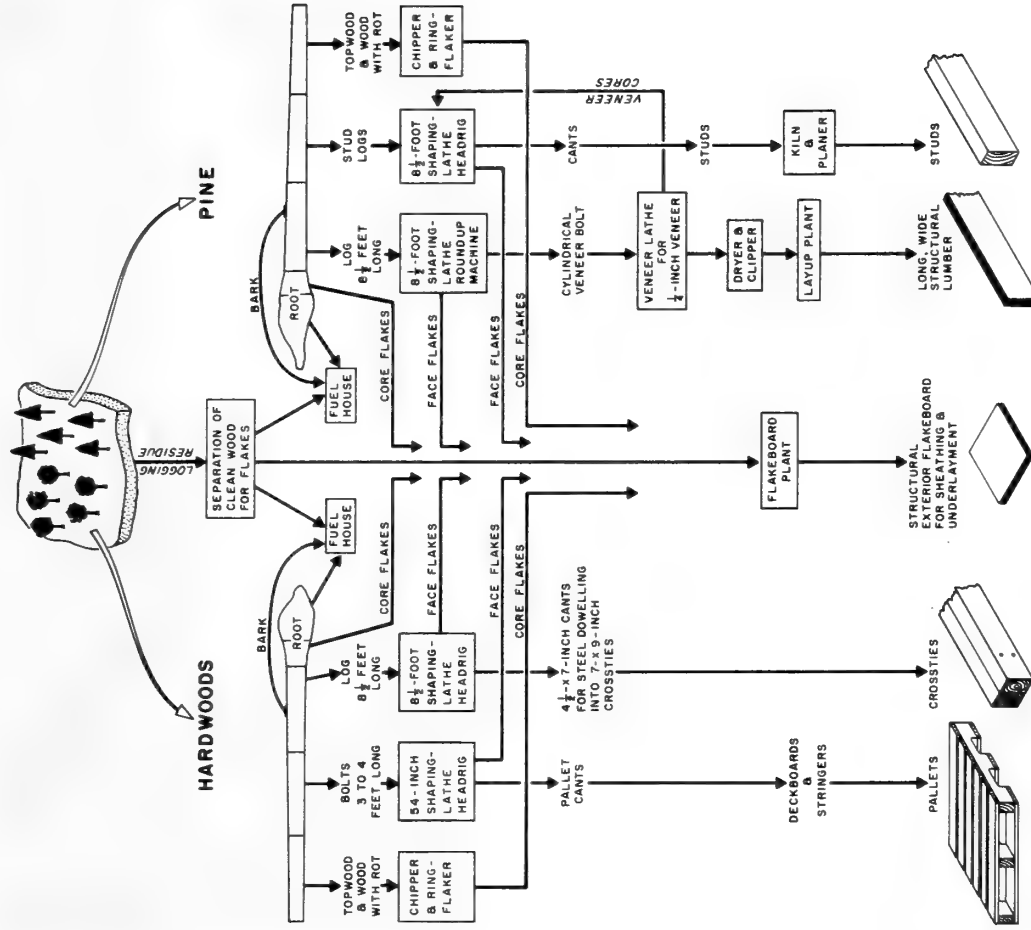
Rocky Mountain Station researchers in Arizona have improved ways of evaluating and displaying how alternative management decisions will affect yields of renewable resources: timber, water, forage for livestock and wildlife, and recreation opportunities. Visual displays of how resources are affected will make it easier for both interested citizens and land managers to evaluate the complex interactions among resources and the consequences of alternative decisions.

## Double Yield From Southern Pine?

Incomplete use of the resource has traditionally been a problem in forestry. As late as 15 years ago, only about 30 percent of the above—and below—ground portions of southern pine trees harvested for lumber was actually used. And low-grade hardwoods were not used at all. Since then the Southern Station has developed an integrated harvesting and utilization system that could more than double the production of salable wood from each acre of land harvested. Called BRUSH (Biomass Recovery and Utilization with Shaping-Lathe Headrigs), the system could recover two-thirds of the biomass of all tree species as solid wood products.

The system is built around a number of key machines invented or developed by Station scientists. These include: the shaping-lathe headrig for producing flakes and cants from pine and hardwood logs or bolts; the tree-puller to harvest trees with the taproot intact; the mobile-chipper to harvest residues and convert them to chips for fuel and fiber; the continuous tunnel kiln to produce straight, dry pine studs in 10 hours; and the suspension burner for direct-firing the kiln using green chips or bark as fuel. The products of this system are crossties, pallets, studs, structural exterior flakeboard that can compete with sheathing grades of plywood, and structural pine lumber in any desired length or width laminated from 1/4-inch veneer.

The system is operational and could be in widespread use in less than 10 years.







## Handbooks for Forest Managers

Growing a forest demands a lot of things: reproducing or planting a new stand, protecting it against insects and disease, nurturing its development, and harvesting its products. To do these jobs skillfully, the forest manager must have on hand the most current technical information.

He now has it—in a series of new handbooks that provide the latest and best information on eight tree species or groups of species common to north central forests. Scientists from the North Central Station have combined their silvicultural knowledge with the research and experience of others into convenient guides for onsite use. All the handbooks have a similar format, highlighted by a “Key to Recommendations” that can lead the forest manager to the silvicultural treatments prescribed for his particular stand of trees.

Although they deal primarily with timber production, these handbooks also suggest ways of modifying management practices to enhance recreation, wildlife, water, and other forest values.

Separate handbooks are available for four northern conifers—jack pine, red pine, black spruce, and white-cedar—and four hardwoods (or groups of hardwoods)—aspen, black walnut, northern hardwoods, and oaks.

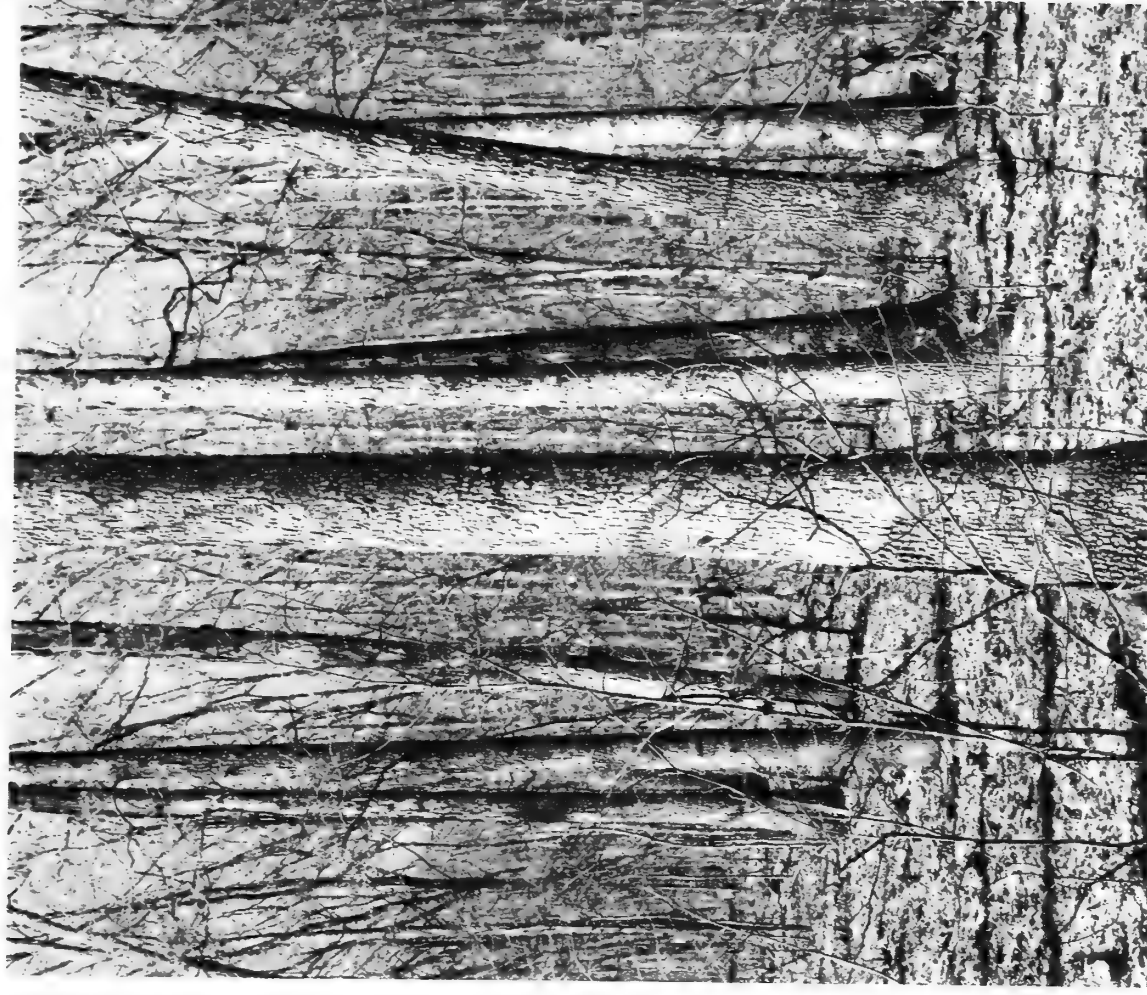


## Management Guide for Allegheny Hardwoods

Many guides have been developed to aid foresters in judging how well a stand is stocked.

Researchers from the Northeastern Station have developed a new guide for Allegheny hardwoods describing maximum stocking to be expected in undisturbed stands and the minimum stocking needed for full yield in mixtures of black cherry, red maple, sugar maple, beech, white ash, birch, and other species. This guide incorporates for the first time a measure of the widely different growing space requirements of the various species that comprise this complex forest.

This information will permit accurate evaluation of Allegheny hardwood stocking and will provide a sound basis for determining minimum densities to leave after thinning or selection cutting.





## Test-Tube Trees for Hawaii

Not to be outdone by the recent test-tube baby, scientists at the Pacific Southwest Station have produced a clone of test-tube trees by propagating koa through "tissue culture." Koa is a valuable timber tree in Hawaii. Unfortunately, straight-stemmed, fast-growing superior trees are becoming rare, and the species is difficult to propagate by cuttings or other conventional methods.

From a single line of callous tissue—capable of cell division and root formation—the scientists produced hundreds of shoots, which continue to proliferate. They worked out a process by which the shoots were made to root and eventually grow in the nursery into healthy young trees.

Nursery-grown trees from the clone have been successfully established in field plantations, where they have attained normal form and growth rate. While tissue or single-cell cloning of other plants is somewhat more common, the techniques have been proved successful with perhaps no more than a half dozen tree species.

Tissue propagation ensures that all the young plants will be genetically identical to the parent tree. Each rooted plantlet continues to produce numerous shoots, which can be separated and grown independently to increase the clone.

Once established, tissue culture will produce young trees much more rapidly, less expensively, and in far less space than is required for vegetative cuttings from 5- or 6-year-old trees.

By selecting superior koa trees and cloning them through tissue culture, the scientists will provide growing stock that will greatly improve the quality of managed forests in Hawaii.

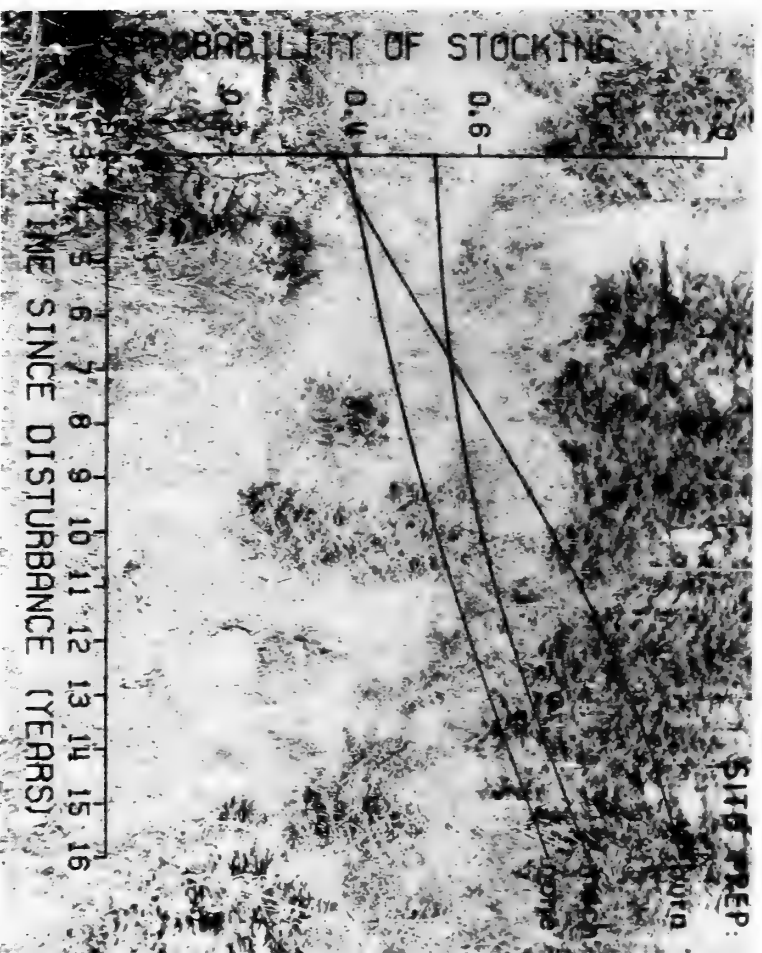
## New Nurse Tree for Walnut

Sometimes even a sturdy-looking thing like a tree needs some help in growing. Often, that help comes from minute bacteria living in nodules on the roots of other plants. These bacteria change nitrogen from a gas into a usable form that all living things need—including black walnut trees.

Researchers from the North Central Station have found that they can use nitrogen-fixing plants, such as autumn-olive, to boost the growth of black walnut trees. On poor sites, young walnut trees may stagnate—stop growing—from lack of nitrogen before they are 10 years old. By planting walnut in mixture with autumn-olive, scientists have overcome this stagnation without resorting to fertilization. In plantations in Missouri, Indiana, and Illinois, walnut grown in mixture with this “nurse” tree averaged 82 percent taller than those in pure stands.



Rows of nitrogen-fixing autumn-olive “nurse” black walnut trees.



## Models Now Predict Forest Development

Intensive forest management depends on how well managers can predict future stand development. Timber harvesting is scheduled and management dollars are allocated according to such predictions.

Forest managers now have a valuable tool—sophisticated computer models—to accurately predict growth and yield of mixed forest stands. The rate of regeneration, after such practices as planting, site preparation, or partial cutting, can be forecast through use of the models. Thus, the manager can select a combination of cutting practices or regeneration methods that will be best for each location. Potential problem areas can be identified, and research and management efforts can be directed to increasing the productivity of such sites.

The models, developed by the Intermountain Station, are now being used by managers of public and some industrial land. Most of the National Forests in northern Idaho and Montana are incorporating the methods in their forest inventory and land management planning activities.

## Good Forestry Pays Dividends

Foresters consistently say that the future demand for timber can easily be met if private landowners will just apply simple forestry practices. These practices cost money—how good are they as investments?

In the Southern United States they are often attractive, according to analyses recently completed. If a 3 percent annual increase in stumpage price is projected, rates of return exceed 10 percent per year for various forms of tree planting and timber stand improvement on sites of moderate to high productivity. And these are what economists call “real rates”—effects of inflation have been removed. Rates of return and acreages that could be treated have not yet been compiled for the rest of the Nation, but they soon will be. It is all part of a national effort by the Forest Service, the Forest Productivity Committee of the Forest Industries Council, and a host of cooperators.

Computation of rates of return is the last and probably the easiest step in a difficult process that is nearing completion in the Nation's 26 largest timber producing States. Regional panels listed specific treatments that appear desirable, and the Forest Service estimated how much land in each State could benefit from each treatment. Public, forest industry, and other private lands were tested separately. Forestry experts from industry, government, and universities in each State estimated costs of treatments and increases in yield attributable to the treatments.

The result will be the first realistic nationwide assessment of opportunities to increase timber supplies through public and private investment. National figures will be published by the Forest Service in the Resources Planning Act Assessment, and figures for individual States will be published by the Forest Industries Council.







## Site Evaluation for Southern Hardwoods Made Easy

Soil scientists at the Southern Station have devised an accurate method for determining suitability of sites for eight of the most important hardwood species planted in the South. The method, recently published as a field guide, enables forest managers to assign numerical site index ratings to any soil or site in the southern hardwood region, except in mountainous areas.

One of the best features of the new technique is that it is easy to use. In fact, it doesn't even require knowing the soil series. And, it provides guidelines for improving the soil. For cottonwood, the leading plantation hardwood in the South, the method can be used to estimate volume production at various ages.

The approach is based on the fact that each of four major soil factors (physical condition, moisture, nutrient availability, and aeration) accounts for a certain proportion of tree growth. By examining each property of a soil and deciding whether it is good, adequate, or bad for a particular species, one arrives at a site-quality rating.

Field testing was only recently completed, but the method is already widely used across the South. Forestry interests have requested expansion to include additional species, and work has begun to add five more important hardwoods.

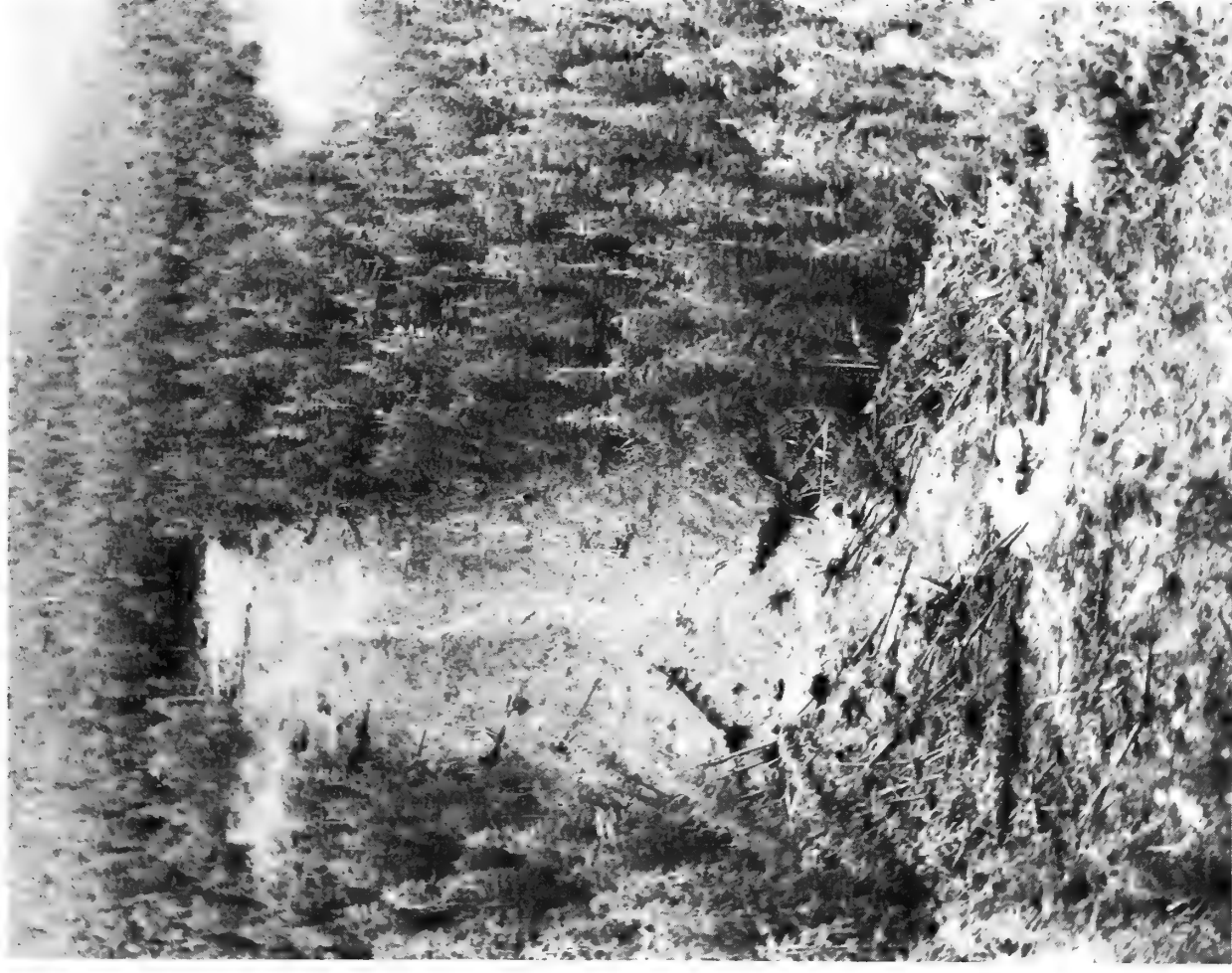


## Predicting and Preventing Landslides

A 5-year research program has revealed much about the cause and prevention of landslides in the Pacific Northwest. Scientists from the Pacific Northwest, Pacific Southwest, and Intermountain Stations have made progress in defining the mechanics of land failure and quantifying the contributing factors, and have begun to develop practical methods to identify potential problem areas.

Preliminary findings indicate that soil is strengthened by the intertwinning and anchoring of root structures. The effect of timber harvest practices on development of landslides has been defined and is being quantified for specific areas. In addition, researchers now know how much rainfall will cause soil to move on slopes, the effect of bedrock types and structure on the generation of landslides, and the type of landslide caused by major storms.

The program is now moving into a second stage with emphasis on applying research results in managed forests. A 5-year program has begun in southeast Alaska to (a) develop techniques for predicting landslide hazard resulting from forest management activities, (b) identify moisture conditions and storm characteristics that could trigger landslides under different geomorphic and geologic conditions, and (c) measure onsite and downstream landslide damage to water quality and anadromous fish habitat. The techniques developed are expected to be applicable throughout the Pacific Northwest.





## Impact of Roadless Areas on Timber Harvest

If money that might be spent to build roads into roadless areas of the National Forests were used instead for intensive management of timber on accessible lands, could timber harvest be maintained? The suggestion that as much—or more—timber might be produced with such a reallocation of funds prompted the Forest Service to look for answers to this question on seven western National Forests.

The answer—if all roadless areas on the study forests were withdrawn from timber production—is definitely *no*. Researchers found that lack of money for intensive management is not the only factor limiting the amount of timber that can be grown and harvested. The growing capacity of the land, under current restraints to provide for multiple uses of the forests, has been reached on many areas, and spending additional money would not result in increased production. If only half of the roadless areas were withdrawn, one of the study forests could produce the same amount of timber.

Researchers also compared the timber harvests that would be possible under such a reallocation of funds with average harvests of the past 10 years. They found that with all roadless areas withdrawn, recent levels could be continued on two of the seven forests; with half the roadless areas withdrawn, recent levels could be continued on six forests.

## ENVIRONMENT

## Recreation

## Hiking and Camping

- Dindal, D., and L. Levitan.  
1977. The soil invertebrate community of composting toilet systems. *In Proc. VI Colloquium Soil Zoology, Uppsala, Sweden.* (NE)  
Fay, S. C., and R. E. Leonard.  
1977. Handling backcountry privy wastes by bin composting. *APPALACHIA* 41(12):118-122. (NE)  
Fay, S. C., and R. H. Walke.  
1977. The composting option for human waste disposal in the backcountry. *U.S. Dep. Agric. For. Serv. Res. Note NE-246.* (NE)  
Godin, V. B., and R. E. Leonard.  
1977. Design capacity for management decision-making *In* Quantitative ecology workshop, p. 53-54. *Proceedings Coll. Life Sci. and Agric. Univ. N.H.* (NE)  
Godin, V. B., and R. E. Leonard.  
1977. Who is violating the law of the land. *APPALACHIA* 41(4): 8-23. (NE)  
Leonard, R. E., and S. C. Fay.  
1978. A compost bin for handling privy wastes: its fabrication and use. *U.S. Dep. Agric. For. Serv. Res. Note NE-254.* (NE)  
Leonard, R. E., H. J. Plumley, and W. R. Holman.  
1977. A design capacity system, p. 160-163. *In Proc. Natl. Trails Sympos.* (NE)  
Leonard, R. E., and A. W. Whitney.  
1977. Trail transect: a method for documenting trail changes. *U.S. Dep. Agric. For. Serv. Res. Pap. NE-389.* (NE)  
Rinehart, Robert P., Colin C. Hardy, and Henry G. Rosenau.  
1978. Measuring trail conditions with stereo photography. *J. For.* 76(8):501-503. (INT)

## Management Considerations

- Brown, P. J., B. L. Driver, and C. McConnell.  
1978. The opportunity spectrum concept and behavioral information in outdoor recreation resource supply inventories: background and application. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55*, p. 73-84. (RM)  
Cordell, H. K.  
1977. Analysis of research needs for recreation and preserved lands management in Western North Carolina, p. 95-100. *In Proc. West. N.C. Res. Resour. Manage. Conf.* (SE)  
Downing, Kent B., Phillip B. Delucchi, and William R. Williams.  
1977. Impact of the Douglas-fir tussock moth on forest recreation in the Blue Mountains. *U.S. Dep. Agric. For. Serv. Res. Pap. PNW-224*. 14 p., illus. (PNW)  
Driver, B. L., and Perry J. Brown.  
1978. The opportunity spectrum concept and behavioral information in outdoor recreation resource supply inventories: a rationale. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55*, p. 24-31. (RM)  
Elsner, Gary H.  
1977. State-of-the-art methods for research, planning, and determining the benefits of outdoor recreation. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PSW-20*, 62 p., illus. (PSW)  
Erickson, D. L., H. K. Cordell, and A. C. Davis.  
1977. Public land policy: an evaluation of decision and citizen involvement systems. *J. Environ. Manage.* 5:365-377. (SE)  
Hendee, John C.  
1977. Public involvement in the U.S. Forest Service roadless-area review: lessons from a case study. *In Public participation in planning*, chap. 7, 89-103, illus. *John Wiley & Sons Ltd., Chichester, England.* (PNW)  
Hogan, Timothy D.  
1977. Second-home ownership in northern Arizona: a profile and implications for the future. *Ariz. State Univ. Eisenhower Consortium Inst. Ser. Rep. 2*. 113 p. (RM)  
Kuehner, Richard A., and Gary H. Elsner.  
1978. Response of visitors to the Rainbow Trail: an evaluation of an interpretive area in the Lake Tahoe Basin, Calif. *U.S. Dep. Agric. For. Serv. Res. Pap. PSW-131*, 17 p., illus. (PSW)

- Lee, Robert W., Ralph H. Ramsey, III, and Lloyd V. Urban.  
1978. Environmental guidelines for second home developments in mountain areas. Tex. Tech. Univ. Eisenhower Consortium Inst. Ser. Rep. 3. 125 p. (RM)
- Lime, David W., and Robert C. Lucas.  
1977. Good information improves the wilderness experience. *Naturalist* 28(4):18-21. (NC)
- Marchand, Peter J.  
1977. Subalpine bogs of the Mahoosuc Range, Maine: physical characteristics and vegetation development. Center for North. Studies, Wolcutt, Vt. 19 p. (NE)
- Wagar, J. Alan.  
1977. Recreational carrying capacity, p. 168-175. *In* Proc. Wildland Recreational Conf. (PSW)
- Wagar, J. Alan.  
1977. Wildland recreation and resource management, p. 11-21. *In* Proc. Wildland Recreation Conf. (PSW)
- Wagar, J. Alan.  
1977. Resolving user conflicts, p. 133-145. *In* Proc. Wildland Recreation Conf. (PSW)
- Washburne, Randel F.  
1978. Black under-participation in wildland recreation: alternative explanations. *Leisure Sci.* 1(2):175-189. (PNW)

## Scenic Beauty and Wilderness

- Clark, Roger N., and Robert C. Lucas.  
1978. The forest ecosystem of southeast Alaska: outdoor recreation and scenic resources. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PNW-66, 116 p., illus. (PNW)
- deBettencourt, J.S., G. L. Peterson, and P. K. Wang.  
1978. Managing wilderness travel: a Markov-based linear programming model. *Environ. and Planning. Vol. A.* 10:71-79. (NC)
- Elsner, Gary H.  
1978. New techniques for coordinating timber harvesting and esthetic values, p. 46-52. *In* Proc. 1977 Soc. Am. For. Natl. Conv. (PSW)
- Lime, David W.  
1978. A selected bibliography of literature on human behavioral aspects of wildlife for nonconsumptive purposes, p. 314-316. *In* 10th North American moose workshop proceedings. Minn. Dep. Nat. Resour. 316 p. (NC)

- Lime, David W.  
1978. Moose as a nongame recreational resource. *In* 10th North American moose workshop proceedings, p. 110-134. Minn. Dep. Nat. Resour. 316 p. (NC)

- Lime, David W.  
1977. When the wilderness gets crowded....? *Naturalist* 28(4):1-5. (NC)
- Myklestad, Erik, and J. Alan Wagar.  
1977. PREVIEW: computer assistance for visual management of forested landscapes. *Landscape Planning* 4(1977):313-331. (PSW)
- Shafer, E. L., Jr., and R. O. Brush.  
1977. How to measure preferences for photographs of natural landscapes. *Landscape Planning* 4:237-256. (NE)
- Stankey, George H.  
1977. Recreational geography; its evolution and application to problems of wilderness management. *In* Applications of geographic research, p. 75-87. Dep. Geogr., Mich. State Univ. (INT)
- Wetzstein, Michael E., and Richard D. Green.  
1978. Use of principal component attractiveness indexes in recreation demand functions. *West. J. Agric. Econ.* p. 11-21. (PSW)
- Williamson, D., J. Fabos, and R. Brush.  
1977. The visual screening potential of forest vegetation. *Landscape Archit. Quart.* 68(1):44. (NE)

## Water Recreation

- Anderson, D. H., Leatherberry, E. C., and Lime, D. W.  
1978. An annotated bibliography on river recreation. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-41, 62 p. (NC)
- Driver, B. L., and R. W. Cooksey.  
1978. Preferred psychological outcomes of recreational fishing. *In* Catch and release fishing as a management tool symposium proceedings. Humboldt State Univ. (RM)
- Hendee, John C., Roger N. Clark, and Thomas E. Dailey.  
1977. Fishing and other recreation behavior at high-mountain lakes in Washington State. U.S. Dep. Agric. For. Serv. Res. Note PNW-304, 27 p., illus. (PNW)

Lime, David W.  
 1977. Alternative strategies for visitor management of western white-water river recreation. *In* Managing Colorado River Whitewater: the carrying capacity strategy symposium proceedings. p. 146-155. Dep. For. and Outdoor Recreation, Utah State Univ. 169 p. (NC)  
 Peterson, G. L.  
 1977. The computer takes a canoe trip. *Naturalist* 28(4):9-11. (NC)  
 Schreyer, and M. L. Nielson.  
 1978. Westwater and Desolation Canyons: whitewater river recreation study. Dep. For. and Outdoor recreation, Utah State Univ. 196 p. (NC)  
 Wesche, Thomas A., Barron L. Weand, Gary W. Rosenlieb, and Lora S. Johnson.  
 1978. Aquatic biota and abiota of selected streams on Thunder Basin National Grassland, Wyoming. Part III. Water Resour. Res. Inst., Univ. Wyo. 153 p. (RM)

More, T., and B. Payne.  
 1978. Affective responses to natural areas near cities. *J. Leisure Res.* 19(1):7-12.(NE)  
 T. F. Stark, and D. R. Miller.  
 1977. Effect of synthetic surfaces and vegetation in urban areas on human energy balance and comfort. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-25, p. 139-151. (NE)  
 Van der Grinten, Martin, Brayton F. Wilson, and Brunell C. Fischer.  
 1977. Forest structure, composition, and vigor in housing developments. *J. For.* 75:653-655. (NE)

## Noise, Microclimate, and Insects

Borthwick, J.O., G. Reethof, O. H. McDaniel, and D. E. Carlson.  
 1977. Attenuation of highway noise by narrow forest belts. (Abstr.) *J. Acoust. Soc. Am.* 62 Suppl. 1, p. S42-S43. (NE)  
 Carlson, D. E., O. H. McDaniel, and G. Reethof.  
 1977. Layered media model for ground absorption. (Abstr.) *J. Acoust. Soc. Am* 62 Suppl. 1, p.S42. (NE)  
 Carlson, D., O. H. McDaniel, and G. Reethof.  
 1977. Layered media model for ground absorption. *Inter-Noise* 77. Vol 2. (NE)

Cook, David L., and David F. Van Haverbeke.  
 1977. Suburban noise control with plant materials and solid barriers. U. S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-25, 234-241. (RM)  
 Herrington, L. P., and C. Brock.  
 1977. Propagation of noise over and through a forest stand. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-25, p. 226-228. (NE)  
 Herrington, L., and J. Vittum.  
 1977. Human thermal comfort in urban outdoor spaces. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-25, p. 130-138. (NE)  
 Nielsen, David G., and Michael E. Montgomery.  
 1977. Toxicity and persistence of foliar insecticide sprays against black vine weevil adults. *J. Econ. Entomol.* 70(4):510-512. (NE)  
 Plumley, H. J.  
 1977. Design of outdoor urban spaces for thermal comfort. U.S. Dep. Agric. For. Serv. Tech. Rep. NE-25, p. 152-162. (NE)  
 Reethof, G., O. H. McDaniel, and G. M. Heisler.  
 1977. Sound absorption characteristics of tree bark and forest floor. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-25, p. 206-217. (NE)

## Urban Forestry

### Housing and Energy

DeWalle, D. R., and R. E. Jacobs.  
 1977. Trees around properties cut home heating costs. *Sci. Agric.* 24(4):9. (NE)  
 Harris, Richard W., Jack L. Paul, and Andrew T. Leiser.  
 1977. Fertilizing wood plants. Univ. Calif. Div. Agric. Sci. Leaflet. 2958. 23 p. (PSW)  
 Heisler, Gordon M.  
 1978. Discussion of 'Amelioration — how trees reduce energy loss in cities'. *In* Proc. Soc. Am. For. Annu. Conv. 1977:67-70. (NE)  
 Jacobs, R. E., and D. R. DeWalle.  
 1977. Effects of forest vegetation on energy consumption for trailer heating. Tech. Comp. Rep., Grant PL 85-934, U.S. Dep. Agric. For. Serv. Pinchot Inst. Environ. For. Res., 61 p. (NE)  
 Miller, Robert W., Robert S. Bond, and Brian R. Payne.  
 1978. Land and timber values in an urban region. *J. For.* 76(3):165-166. (NE)



## environment

Wallner, William E.

1978. Scale insects: what the arboriculturist needs to know about them. *J. Arboric.* 4(5):97-103. (NE)

Wagar, J. Alan

1977. Why interpretation? meeting the challenge. *J. Interpretation* 3(1):6-10. (PSW)

## People

Benjamin, John C., George H. Moeller, and Douglas A. Morrison.

1977. Measuring environmental attitudes of elementary school students. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-30*, p. 95-100. (NE)

Dickerson, A. Laverne.

1977. The youth conservation corps and adolescents' self-concept. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-30*, p. 143-149. (NE)

Magill, Arthur W.

1977. The challenge of interpretation in urban forestry. *Interpreter* 9(4):7-9. (PSW)

Moeller, George. H.

1977. Research priorities in environmental education. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-30*, p. 219-222. (NE)

More, Thomas A.

1977. An analysis of wildlife in children's stories. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-30*, p. 89-92. (NE)

Robertson, D. L., and R. A. Rowntree.

1977. Behavioral significance of milieu: a consideration of two downtown settings. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-25*, p. 399-407. (NE)

Shafer, Elwood L.

1977. Research needs for programs that provide natural environments for children. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-30*, p. 215-217. (NE)

Wagar, J. Alan.

1978. Environmental interpretation in urban settings. *In Proc. Assoc. Interpretive Nat. West. Interpreters Assoc. Workshop Conf.* 4 p. (PSW)

## Urban Wildlife

DeGraaf, R. M.

1977. Bringing in the birds. *Mass. Wildl.* 28(5):14-17. (NE)

DeGraaf, R. M.

1978. New life from dead trees. *Natl. Wildl.* 16(4):28-31. (NE)

Paulick, R. K., and J. L. George.

1978. Determination of habitat components utilized by avian species in a planned suburban community. *Res. Briefs, Sch. For. Resour. Penn. State Univ.* 11(1):19-21. (NE)

## Watershed Management

### Chemicals in the Forest Environment

Davis, E. A.

1978. Transpiration reduction of shrub live oak by picloram. *For. Sci.* 24(2):217-221.

Hawkes, Clifford L., and Logan A. Norris.

1977. Chronic oral toxicity of 2, 3, 7, 8-Tetrachlorodibenzo-p-dioxin (TCDD) to rainbow trout. *Trans. Am. Fish. Soc.* 106(6):641-645, illus. (PNW)

Kirkland, Gordon L., Jr.

1978. Population and community responses of small mammals to 2, 4, 5-T. *U.S. Dep. Agric. For. Serv. Res. Note PNW-314*, 6p. (PNW)

Miyamoto, S.

1978. Tolerance of some southwestern range plants to sodium chloride and sulfate. *Tex. Agric. Exp. Stn., Tex. A&M Univ. Syst.*, PR-3480. 8 p. (RM)

Newton, M., and L.A. Norris.

1978. A framework for dealing with herbicide controversy. (Abstr. 120) *Weed Sci. Soc. Am.* (PNW)



- Norris, Logan A.  
1977. The behavior of 2,4,5-T and TCDD in the environment. *In* Forests for people—a challenge in world affairs, p. 252-255. Proc. Soc. Am. For. 1977 Natl. Conv. (PNW)
- Norris, Logan A.  
1977. Introduction to 2,4,5-T workshop: update on a controversy. *In* Forests for people—a challenge in world affairs, p. 251. Proc. Soc. Am. For. 1977 Natl. Conv. (PNW)
- Norris, L. A., M. L. Montgomery, and E. R. Johnson.  
1977. The persistence of 2,4,5-T in a Pacific Northwest forest. *Weed Sci.* 25:417-422. (PNW)
- Norris, L. A., M. L. Montgomery, C. A. Troendle, and J. M. Kochenderfer.  
1978. 2,4,5-T persistence in a West Virginia watershed. (Abstr. 83) *Weed Sci. Soc. Am.* (PNW)
- Norris, L. A., and J. M. Witt.  
1978. Rare earth elements for fingerprinting spray solutions used in brush control. (Abstr. 15) *Weed Sci. Soc. Am.* (PNW)
- Rothenberger, S. J., and D. S. Galitz.  
1977. Effects of Cd, Zn, Pb and Mo on germination and growth of selected grasses. *Plant Physiol.* 59:669. (RM)
- Rothenberger, S. J., and D. S. Galitz.  
1977. Toxic effects of cadmium and zinc on selected grass species. *In* Proc. No. Dak. Acad. Sci. 31:26. (RM)
- ### Controlling Soil Erosion
- Day, Norman F., Walter F. Megahan, and Douglas Hattersley.  
1977. Landslide occurrence in the Clearwater National Forest: 1974-1976. Proc. Natl. Mat. Eng. Workshop. 13 p. (INT)
- Duffy, Paul D.  
1977. Fertilization to accelerate loblolly pine foliage growth for erosion control. U.S. Dep. Agric. For. Serv. Res. Note SO-230, 4 p. (SO)
- Durgin, Philip B.  
1977. Landslides and the weathering of granitic rocks. *Eng. Geol.* 3:126-131. (PSW)
- Durgin, Philip B.  
1978. Stereogram—useful tool in engineering geology. U.S. Dep. Agric. For. Serv. Eng. Tech. Rep. 1700-6, 6 p. (PSW)
- Heede, Burchard H.  
1977. Influence of forest density on bed load movement in a small mountain stream. *In* Vol. 7, hydrology and water resources in Arizona and the Southwest. p. 103-107. Proc. 1977. Meet. Ariz. Sect., Am. Water Resour. Assoc. and Hydrol. Sect., Ariz. Acad. Sci. (RM)
- Heede, Burchard H.  
1978. Designing gully control systems for eroding watersheds. (Abstr.) p. 294. *In* 10th Int. Congr. Sediment. (RM)
- Hughes, William C.  
1978. Estimating the risk of channel erosion. *J. Hydraul. Div., Am. Soc. Civil Eng.* Vol. 104. No. HY3:568-573. (RM)
- Megahan, Walter F.  
1978. Erosion processes on steep granitic road fills in central Idaho. *J. Soil Sci. Soc. Am.* 42(2):350-357. (INT)
- Megahan, Walter F.  
1978. Sedimentation research, p. 2-19. *In* Proc. Applied Water Resour. Manage. Workshop. (INT)
- Patric, J. H.  
1976. Soil erosion in the eastern forest. *J. For.* 74(10):671-677. (NE)
- Patric, J. H., and J. L. Gorman.  
1978. Soil disturbance caused by skyline cable logging on steep slopes in West Virginia. *J. Soil and Water Conserv.* 33(1):32-35. (NE)
- Rice, R. M., and S. A. Sherbin.  
1977. Estimating sedimentation from an erosion-hazard rating. U.S. Dep. Agric. For. Serv. Res. Note PSW-323, 4 p., illus. (PSW)
- Roundy, B. A., and W. H. Blackburn, and R. E. Eckert, Jr.  
1978. Influence of prescribed burning on infiltration and sediment production in the pinyon-juniper woodland, Nevada. *J. Range Manage.* 31:250-253. (INT)
- Swanson, Frederick J., and Douglas N. Swanson.  
1977. Complex mass-movement terrains in the western Cascade Range, Oregon. *In* Reviews in engineering geology, Vol. 3, landslides, p. 113-124. *Geol. Soc. Am.* (PNW)
- Yee, Carlton S., and R. Dennis Harr.  
1977. Effect of wetting mode on shear strength of two aggregated soils. U.S. Dep. Agric. For. Serv. Res. Note PNW-303, 9 p., illus. (PNW)
- Yee, Carlton S., and R. Dennis Harr.  
1977. Influence of soil aggregation on slope stability in the Oregon Coast Ranges. *Environ. Geol.* 1(6):367-377. (PNW)

- Ziemer, R. R., and D. N. Swanson.  
1977. Root strength changes after logging in southeast Alaska. U.S. Dep. Agric. For. Serv. Res. Note PNW-306, 10 p., illus. (PNW)
- Ziemer, Robert R.  
1977. Measurement of soil creep by inclinometer. U.S. Dep. Agric. For. Serv. Eng. Tech. Rep. 7100-4, 10 p. (PSW)
- Ziemer, R. R., and D. N. Swanson.  
1977. Root strength changes after logging in southeast Alaska. U.S. Dep. Agric. For. Serv. Res. Note PNW-306, 10 p. (PSW)
- Ziemer, Robert R.  
1978. An apparatus to measure the crosscut shearing strength of roots. Can. J. For. Res. 8(1):142-144.

## Management, Rehabilitation, and Improvement

- Alexander, Robert R.  
1978. The Fraser Experimental Forest, Colorado. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-40A, 9 p. (RM)
- Boelter, Don H., and Elon S. Verry.  
1977. Peatland and water in the northern Lake States. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-31, 22 p. (NC)
- Boelter, Don H.  
1978. Drainage experience in Lake States and northern European peatlands, p. 167-175. *In* Proc. Soil Moisture — Site Prod. Symp. (NC)
- Bond, M.E., and Robert H. Dunikoski.  
1977. The impact of second-home development on water availability in north central Arizona. Ariz. State Univ. Eisenhower Consortium Inst. Ser. Rep. 88 p. (RM)
- Clary, Warren P.  
1978. Producer-consumer biomass in Arizona ponderosa pine. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-56, 4 p. (RM)
- DeBano, Leonard F.  
1977. Influence of forest practices on water yield, channel stability, erosion, and sedimentation in the southwest. *In* Forests of people, p. 74-78. Proc. Soc. Am. For. 361 p. (RM)
- Douglass, James E.  
1977. State of the art in managing water resources on forest land. *In* Proc. West. N.C. Res. Resour. Manage. Conf. (SE)

- Ewel, K.C., S. J. Hood, and R. L. Myers.  
1978. Simulation of dynamics of a managed splash-pine ecosystem on poorly drained soils. IMPAC Rep. 3(6):14. (SE)
- Fogel, Robert, and Kermit Cromack, Jr.  
1977. Effect of habitat and substrate quality on Douglas-fir litter decomposition in western Oregon. Can. J. Bot. 55(12):1632-1640, illus. (PNW)
- Gary, Howard L., and Pat O. Currie.  
1977. The front range pine type: a 40-year photographic record of plant recovery on an abused watershed. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-46, 17 p. (RM)
- Griffing, Charles G., and Stanley J. Ursic.  
1977. Ethephon advances loblolly pine needle cast. For. Sci. 23:351-354. (SO)

- Hibbert, Alden R.  
1977. Distribution of precipitation on rugged terrain in central Arizona. *In* Hydrology and water resources in Arizona and the Southwest. Vol. 7, p. 163-173. *In* Proc. 1977 Meet. Am. Water Resour. Assoc. and Hydrol. Sect., Ariz. Acad. Sci. (RM)
- Klock, G. O., and C. Huang.  
1977. Some early effects of conifer defoliation on microclimate. (Abstr.) p. 181. Am. Soc. Agron. (PNW)
- Kochenderfer, J. N., and G. W. Wendel.  
1978. Skyline harvesting in Appalachia. U.S. Dep. Agric. For. Serv. Res. Pap. NE-400, 9 p. (NE)
- Lawson, Edwin R.  
1978. Information requirements for watershed management. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55, p. 68-71. (SO)
- Likens, G. E., F. H. Bormann, R. S. Pierce, and W. A. Reiners.  
1978. Recovery of a deforested ecosystem. Science 199:492-496. (NE)
- Lima, W. P., J. H. Patric, and N. Holowaychuk.  
1978. Natural reforestation reclaims a watershed: a case history from West Virginia. U.S. Dep. Agric. For. Serv. Res. Pap. NE-392, 7 p. (NE)
- Minore, Don, Richard E. Carkin, and Richard L. Fredriksen.  
1977. Comparison of silvicultural methods at Coyote Creek watersheds in southwestern Oregon—a case history. U.S. Dep. Agric. For. Serv. Res. Note PNW-307, 12 p., illus. (PNW)
- Miyamoto, S., and J. B. Bird.  
1978. Effects of two wetting agents on germination and shoot growth

of some southwestern range plants. *J. Range. Manage.* 31(1):74-75. (RM)

Patric, James H.  
1978. Hydrology. *In* Yearbook of science and technology. p. 230-232. McGraw-Hill Book Co., New York. 417 p. (NE)

Patric, J. H., and J. H. Smith.  
1978. Can cable logging better protect southern forests? *Timber Harvesting* 26(4):32-33. (NE)

Pavicek, Kenneth A., Gordon V. Johnson, and Earl A. Aldon.  
1977. Vegetative propagation of desert saltgrass rhizomes. *J. Range Manage.* 30(5):377-380. (RM)

Plass, William T.  
1977. Growth and survival of hardwoods and pine interplanted with European alder. *U.S. Dep. Agric. For. Serv. Res. Pap. NE-376.* 10 p. (NE)

Replogle, J. A., H. Riekerk, and B. F. Swindel.  
1978. Water monitoring in coastal forest watershed studies. *IMPAC Rep.* 3(2):20. (SE)

Rothwell, Frederick M., and Coleman Holt.  
1978. Vesicular-arbuscular mycorrhizae established with *Glomus fasciculatus* spores isolated from the feces of cricetine mice. *U.S. Dep. Agric. For. Serv. Res. Note NE-259.* 4 p. (NE)

Schier, George A., and Robert B. Campbell.  
1978. Aspen sucker regeneration following burning and clearcutting on two sites in the Rocky Mountains. *For. Sci.* 24:303-308. (INT)

Smith, James L., N. Caine, R. L. Dix, and others.  
1978. An evaluation of possible effects of weather modification upon vegetation in the American River Basin, Calif. *In* *Sierra ecology project*, Vol. 1. Off. Atmos. Resour. Manage., Bur. Reclam., U.S. Dep. Inter., Denver, Colo. (PSW)

Smith, James L., G. T. Ferrell, T. W. Koerber, and others.  
1978. An evaluation of possible effects of weather modification upon forest insects and diseases in the American River Basin, Calif. *In* *Sierra ecology project*, vol 1. Off. Atmos. Resour. Manage., Bur. Reclam., U.S. Dep. Inter., Denver, Colo. (PSW)

Smith, James L. and G. L. Huntington.  
1978. Ecological description of the American River Basin. *In* *The Sierra ecology project*, Volume I. Off. Atmos. Resour. Manage., Bur. Reclam., U.S. Dep. Inter., Denver, Colo. (PSW)

Smith, James L., W. M. Longhurst, D. L. Neal, and others.  
1978. An evaluation of possible effects of weather modification upon

deer and their habitat in the American River Basin, California. *In* *Sierra ecology project*, vol. 1, p. III-1 to III-99. Off. Atmos. Resour. Manage., Bur. Reclam., U.S. Dep. Inter., Denver Colo. (PSW)

Troendle, Charles A.  
1978. Hydrologic impacts of silvicultural activities. *ASCE Spring Conv. Preprint No.* 3286. 26 p. (NE)

Urie, Dean H.  
1978. Groundwater differences on pine and hardwood forests of the Udell Experimental Forest in Michigan. *U.S. Dep. Agric. For. Serv. Res. Pap. NC-145.* 12 p. (NC)

Verry, E. S., and Arthur E. Elling.  
1978. Two years necessary for successful natural seeding in nonbrushy black spruce bogs. *U.S. Dep. Agric. For. Serv. Res. Note NC-229.* 4 p. (NC)

Wirtz, William O., II.  
1977. Vertebrate postfire succession. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. WO-3*, p. 46-57. (PSW)

## Soil-Plant-Water Relationships

Brown, R. W.  
1977. Water relations of range plants. *In* *Rangeland plant physiology.* Soc. Range Manage., Range Sci. Ser. 4:97-140. (INT)

Brown, R. W., and Walter T. McDonough.  
1977. Thermocouple psychrometer for *in situ* leaf water potential determinations. *Plant and Soil* 48:5-10. (INT)

Buchanan, Bruce B., K. T. Harper, and Neil C. Frischknecht.  
1978. Allelopathic effects of bur buttercup tissue on germination and growth of various grasses and forbs *in vitro* and in soil. *Great Basin Nat.* 38(1):90-96. (INT)

Burk, Jack H.  
1978. Seasonal and diurnal water potential in selected chaparral shrubs. *Am. Midland Nat.* 99(1):244-248. (PSW)

Davis, Edwin A.  
1977. Root system of shrub live oak in relation to water yield in chaparral. *In* *Hydrology and water resources in Arizona and the southwest.* Vol. 7, p. 241-248. *Proc. 1977 Meet. Ariz. Sect., Am. Water Resour. Assoc. and Hydrol. Sect., Ariz. Acad. Sci.* (RM)

- Federer, C. A.  
1977. Leaf resistance and xylem potential differ among broadleaved species. *For. Sci.* 23(4):411-419. (NE)
- Federer, C. A.  
1976. A SPAC model for transpiration and the availability of soil water. (Abstr.) *Bull. Am. Meteorol. Soc.* 57:1408. (NE)
- Johnson, D. A., and R. W. Brown.  
1977. Psychrometric analysis of turgor pressure response: a possible technique for evaluating plant water stress resistance. *Crop Sci.* 17: 507-510. (INT)
- Lopushinsky, W., and G. O. Klock.  
1978. Effect of defoliation on sap velocity in grand fir (Abstr.). p. 35. Northwest Sci. Assoc., 51st Annu. Meet. (PNW)
- Miller, D. R., and C. A. Federer.  
1976. Sap velocity, atmospheric demand, and transpiration in paper birch and white oak saplings. (Abstr.) *Bull. Am. Meteorol. Soc.* 57: 1407. (NE)
- Sturges, David L.  
1977. Soil water withdrawal and root characteristics of big sagebrush. *Am. Midland Nat.* 98(2):257-274. (RM)

## Soil Productivity and Nutrient Cycling

- Bollen, Walter B.  
1977. Sulfur oxidation and respiration in 54-year-old soil samples. *Soil Biol. and Biochem.* 9:405-410. (PNW)
- Cromack, K., Jr., P. Sollins, R. L. Todd, and others.  
1977. The role of oxalic acid and bicarbonate in calcium cycling by fungi and bacteria: some possible implications for soil animals. *Ecol. Bull.* (Stockholm) 25:246-252. (PNW)
- Dealy, J. Edward, and J. Michael Geist.  
1978. Conflicting vegetational indicators on some central Oregon scablands. *J. Range Manage.* 31(1):56-69, illus. (PNW)
- Debano, L. F., P. H. Dunn, and C. E. Conrad.  
1977. Fire's effect on physical and chemical properties of chaparral soils. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. WO-3*, p. 75-84. (PSW)
- Douglass, James E.  
1977. Site preparation alternatives: quantifying their effects on soil

- and water resources, p. 43-45. *In Proc. Site Prep. Workshop.* (SE)
- Douglass, J. E., and L. W. Swift, Jr.  
1977. Forest Service studies of soil and nutrient losses caused by roads, logging, mechanical site preparation, and prescribed burning in the Southeast. *In Watershed research in Eastern North America: a workshop to compare results.* Vol. II, p. 489-503. Smithsonian. Inst. (SE)
- Foss, J. E., G. O. Klock, and M. S. Patterson.  
1977. Distribution and characteristics of soils developed on tephra near Glacier Peak Washington. (Abstr.) *Agron. Abstr.* 1977 Annu. Meet. p. 169. *Am. Soc. Agron.* (PNW)

- Geist, J. Michael.  
1977. Nitrogen response relationships of some volcanic ash soils. *J. Soil Sci. Soc. Am.* 41(5):996-1000, illus. (PNW)
- Geist, J. Michael, and Lee Ehmer.  
1978. Soil chemical properties and management implications for selected SRI sampling sites on the Umatilla National Forest, p. 2-6. *In Soil Resour. Inventory.* (PNW)
- Graustein, William C., Kermit Cromack, Jr., and Phillip Sollins.  
1977. Calcium oxalate: occurrence in soils and effect on nutrient and geochemical cycles. *Science* 198:1252-1254, illus. (PNW)
- Knighton, M. Dean.  
1977. Soil changes after haymeadow abandonment in southwestern Wisconsin. *U.S. Dep. Agric. For. Serv. Res. Pap. NC-146*, 6 p. (NC)
- McNabb, D. H., J. M. Geist, and C. T. Youngberg.  
1977. Nitrogen fixation by *Ceanothus velutinus* in northeastern Oregon. (Abstr.) p. 127-128. *Am. Soc. Agron.* (PNW)
- Monk, C. D., D. A. Crossley, Jr., R. L. Todd, and others.  
1977. An overview of nutrient cycling research at Coweeta Hydrologic Laboratory. *In Watershed research in Eastern North America: a workshop to compare results.* Vol. 1., p. 35-50. Smithsonian. Inst. (SE)
- Patric, J. H.  
1978. Harvesting effects on soil and water in the eastern hardwood forest. *South. J. Applied For.* 2(3):66-73. (NE)
- Sartz, Richard S., and M. Dean Knighton.  
1978. Soil water depletion after four years of forest regrowth in southwestern Wisconsin. *U.S. Dep. Agric. For. Serv. Res. Note NC-230*, 3 p. (NC)
- Swank, W. T., and J. E. Douglass.  
1977. Nutrient budgets for undisturbed and manipulated hardwood forest ecosystems in the mountains of North Carolina. *In Watershed*

- research in Eastern North America: a workshop to compare results. Vol. I, p. 343-364. Smithsonian, Inst., (SE)
- Tiedemann, A. R., W. Lopushinsky, and H. J. Larsen, Jr. 1978. Plant and soil responses to a commercial algae inoculant. (Abstr.) p. 27. 59th Annu. Meet. Am. Assoc. Advance. Sci., Pac. Div. (PNW)
- Tiedemann, Arthur R., and James O. Klemmedson. 1977. Effect of mesquite trees on vegetation and soils in the desert grassland. *J. Range Manage.* 30(5):361-367, illus. (PNW)
- Waide, J. B., and W. T. Swank. 1977. Simulation of potential effects of forest utilization on the nitrogen cycle in different Southeastern ecosystems. *In* Watershed research in Eastern North America: a workshop to compare results. Vol. II, p. 767-789. Smithsonian, Inst. (SE)
- Wiebe, H. H., and R. W. Brown. 1977. Temperature gradient effects on *in situ* hygrometer measurements of water potential. *Plant Physiol. Suppl.* 59:52. (INT)
- Wiebe, H. H., R. W. Brown, and J. Barker. 1977. The influence of soil temperature gradients on *in situ* hygrometer measurements. *J. Agron.* 69:933-939. (INT)
- Zinke, Paul J. 1977. Mineral cycling in fire-type ecosystems. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. WO-3, p. 85-94. (PSW)

## Reclamation of Mined Lands

- Aldon, Earl F. 1978. Endomycorrhizae enhance shrub growth and survival on mine spoils. *In* The reclamation of disturbed arid lands, p. 174-179. Univ. N.M. Press, Albuquerque, 196 p. (RM)
- Aldon, Earl F. 1978. Reclamation of coal-mined land in the Southwest. *J. Soil and Water Conserv.* 33(2):75-79. (RM)
- Aldon, Earl F., Dwight Cable, and David Scholl. 1977. Plastic drip irrigation systems for establishing vegetation on steep slopes in arid climates. *In* Proc. Int. Agric. Plastics Cong. 7:107-112. (RM)
- Allaire, Pierre N. 1978. Reclaimed surface mines: a new potential for some North American birds. *Am. Birds* 32(1):3-5. (NE)
- Bjugstad, Ardell J. 1977. Reestablishment of woody plants on mine spoils and management of mine water impoundments: an overview of Forest Service research on the northern High Plains. *In* Reclamation of disturbed lands. Univ. N. Mex. Press, Albuquerque. (RM)
- Brown, R. W., and R. S. Johnston. 1978. Rehabilitation of high elevation mine disturbance. *In* Revegetation of high altitude disturbed lands, workshop III symposium proceedings, p. 116-130. Colo. State Univ. (INT)
- Brown, R. W., R. S. Johnston, and D. A. Johnson. 1978. Rehabilitation of alpine tundra disturbances. *J. Soil & Water Conserv.* 33:154-160. (INT)
- Brown, R. W., R. S. Johnston, and K. Van Cleve. 1978. Rehabilitation problems in alpine and arctic regions. *In* Reclamation of drastically disturbed lands, p. 23-44. Am. Soc. Agron. (INT)
- Curtis, Willie R., and Michael J. Superfeský. 1977. Erosion of surface-mine spoils. *In* New directions in century three: strategies for land and water use. Soil Conserv. Soc. Am. Meet. 32:154-158. (NE)
- Curtis, Willie R. 1977. Surface mining and the flood of April 1977. U.S. Dep. Agric. For. Serv. Res. Note NE-248. 4 p. (NE)
- Davidson, Walter H., and Jane Riddle. 1978. Old strip mine produces... new pulpwood crop. *Pa. For.* 68(2): 18. (NE)
- Dyer, Kenneth L., and Willie R. Curtis. 1977. Effect of strip mining on water quality in small streams in Eastern Kentucky, 1967-1975. U.S. Dep. Agric. For. Serv. Res. Pap. NE-372. 13 p. (NE)
- Farmer, E. E., and W. G. Blue. 1978. Reclamation of lands mined for phosphate. *In* Reclamation of drastically disturbed lands, p. 585-608. Am. Soc. Agron. (INT)
- Frischknecht, Neil C. 1978. Use of shrubs for mined land reclamation and wildlife habitat. *In* Reclamation for wildlife habitat, workshop proceedings, p. 113-127. Ecol. Consult. (INT)
- Orr, Howard K. 1977. Reestablishment of wooded waterways and associated upland



- shrub communities in surface coal mine areas of the northwestern Great Plains. *In* Surface mining and reclamation, 5th symposium proceedings, p. 235-243. NCA/BCR Coal Conf. and Expo IV. (RM)
- Packer, P. E., and E. F. Aldon.  
1978. Revegetation techniques for dry regions. *In* Reclamation of drastically disturbed lands, p. 425-450. Am. Soc. Agron. (INT)
- Riker, R. E., L. R. Anderson, and R. W. Jeppson.  
1978. Engineering properties and slope stability settlement analysis related to phosphate mine spoil dumps in southeastern Idaho. Utah State Univ. Hydraul. and Hydrol. Ser. Rep. H-78-001, 107 p. (INT)
- Schaid, Tim A., and Raymond L. Linder.  
1978. Non-game bird habitat associated with haul roads and surface mining for bentonite clay. S. Dak. Coop. Wildl. Res. Unit Quart. Rep. 15:10-12. (RM)
- Superfeský, Michael J., and George P. Williams, Jr.  
1978. Shear strength of surface-mine spoils measured by triaxial and direct shear methods. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-39. 15 p. (NE)
- Vogel, Willis G., and Willie R. Curtis.  
1978. Reclamation research on coal surface-mined lands in the humid East. *In* Reclamation of drastically disturbed lands symposium proceedings, Ch. 21, p. 379-397. Ohio Agric. Res. & Exper. Stn. (NE)
- Williams, B. D., and P. E. Packer.  
1978. Sewage sludge and other organic materials as amendments for revegetation of spent oil shale, p. 291-294. *In* Proc. Symp. Munic. Wastewater and Sludge Recycling on For. Land and Disturbed Land. (INT)
- Yamamoto, Teruo.  
1978. Mixing overburden to simulate soil conditions A. R. Co. Black Thunder Mine. (Abstr.) *In* Int. Cong. Energy and Ecosystem: Econ., Ecol. and Planning Coal Resour. Develop. (RM)

## Sewage Disposal on Forest Lands

- Cooley, John H.  
1978. Survival and early growth of selected trees on wastewater application sites. U.S. Dep. Agric. For. Serv. Res. Note NC-231, 4 p. (NC)
- Halverson, Howard G.  
1977. Potential urban runoff disposal in urban forests. (Abstr.) p. 15.

- Am. Water Resour. Assoc. 1977 Conf. (NE)
- Harris, A. R., J. H. Cooley, and D. H. Urie.  
1977. Fertilization of aspen with municipal sludge. (Abstr.) Agro. Abstr. (1977), p. 26. Am. Soc. Agron. (NC)
- Hasfurther, V. H., D. H. Foster, and G. D. Lloyd.  
1977. Sizing an evapotranspiration waste disposal system for summer operation. *In* Proc. Natl. Home Sewage Treat. Symp. 2:175-185. (RM)
- Koterba, Michael T., James W. Hornbeck, and Robert S. Pierce.  
1977. Effects of sludge applications on soil water and vegetation in a northern hardwood forest in New England. Water Resour. Res. Cent. Univ. N.H., Res. Rep. 15, 23 p. (NE)
- McBride, F. D., C. Chavengsaksongkram, and D. H. Urie.  
1977. Sludge treated coal mine spoils increase heavy metals in cover crops. U.S. Dep. Agric. For. Serv. Res. Note, NC-221, 4 p. (NC)
- Urie, D. H., A. R. Harris, and J. H. Cooley.  
1978. Municipal and industrial sludge fertilization of forests and wildlife openings, p. 267-284. *In* 1st Annu. Conf. Applied Res. and Practice on Munic. Waste Proc. (NC)
- Ungs, M., R. W. Cleary, L. Boersma, and S. Yingjajaval.  
1977. The quantitative description of transfer of water and chemicals through soils. *In* Land as a waste management alternative. p. 109-137. Mann Arbor Sci. Publ., Inc. (NE)
- Urie, D. H., J. H. Cooley, and A. R. Harris.  
1978. Irrigation of forest plantations with sewage lagoon effluents. *In* Land treatment of wastewater international symposium proceedings. p. 207-213. U.S. Corps Eng. (NC)

## Snow Management

- Baldwin, James A., and J. L. Smith.  
1978. Snowpack evaporation reduction: it's possible, but is it practical?, p. 111-116. *In* Preprint Vol., Conference on Sierra Nevada meteorology, Am. Meteorol. Soc. (PSW)
- Bergen, James D.  
1978. Some measurements of settlement in a Rocky Mountain snow cover. J. Glaciol. 20(82):141-148. (RM)
- Ffolliott, Peter F., and J. R. Thompson.  
1977. Snowpack density on an Arizona mixed conifer forest watershed.



Hydrol. and Water Res. Ariz. and Southwest. 7:227-233. (RM)

Ffolliott, Peter F., and David B. Thorud.  
1977. The southwest frozen assets; snowpack management. *In* Proc. West. Snow Conf. 45:12-18. (RM)

Judson, Arthur.  
1978. The avalanche warning program in Colorado. *In* Proc. Annu. Meet. West. Snow Conf. 45:19-27. (RM)

Lang, Theodore E., and Richard A. Sommerfeld.  
1977. The modeling and measurement of the deformation of sloping snow pack. *J. Glaciol.* 19(81):153-163. (RM)

Schmidt, R. A.  
1977. A system that measures blowing snow. U.S. Dep. Agric. For. Serv. Res. Pap. RM-194, 80 p. (RM)

Smith, James L.  
1978. Historical climatology and snowpack response at Central Sierra snow laboratory. Conference on Sierra Nevada meteorology, p. 111-115. Am. Meteorol. Soc. (PSW)

Sommerfeld, Richard A.  
1977. Preliminary observations of acoustic emissions preceding avalanches. *J. Glaciol.* 19(81):399-409. (RM)

Tabler, Ronald D.  
1978. Visibility in blowing snow, and applications in traffic operations. *Transport. Res. Circ.* 193:9-12. (RM)

Fox, Douglas G.  
1977. Precipitation quality and its effects on stream water quality, and the forest in general. *In* Non-point sources of pollution from forested land, "208" symposium proceedings, p. 103-129. South. Ill. Univ. (RM)

Gosz, James R.  
1977. Effects of ski development and use on forest stream water quality of the Santa Fe Basin, N.M. *For. Sci.* 23(2):167-179. (RM)

Hornbeck, James W., and Robert S. Pierce.  
1978. Acidity of rain and snow: a potential problem for New Hampshire. *For. Notes* 131:6-7. (NE)

McSwain, M. R.  
1977. Baseline levels and seasonal variations of enteric bacteria in oligotrophic streams. *In* Watershed research in eastern North America: a workshop to compare results. Vol. II, p. 555-578. Smithsonian. Inst. (SE)

Pham, D. H., H. G. Halverson, and G. M. Heisler.  
1978. Precipitation and runoff water quality from an urban parking lot and implications for tree growth. U.S. Dep. Agric. For. Serv. Res. Note NE-253. 6 p. (NE)

Riekerk, H., S. A. Jones, L. A. Morris, and D. A. Pratt.  
1978. Hydrology and water quality of the Bradford Forest experimental watersheds. IMPAC Rep. 3(3):29. (SE)

Short, Robert A., James V. Ward, Howard L. Gary, and Pat O. Currie.  
1978. Aquatic biota of Trout Creek, Manitou Experimental Forest, Colorado. U.S. Dep. Agric. Gen. Tech. Rep. RM-54, 13 p. (RM)

Snyder, G. G.  
1978. Forest water quality of three designated "208" study areas. *In* Proc. Applied Water Resour. Manage. Workshop. (INT)

Snyder, G. G., and others.  
1978. Modeling forest water quality of the Upper Gallatin-Madison watersheds using the benchmark system. Completion Rep. p. 181. (INT)

Ursic, Stanley J.  
1977. Water quality impacts of harvesting and regeneration practices. *In* Non-point sources of pollution from forested land, "208" symposium proceedings, p. 223-232. South. Ill. Univ. (SO)

# Water Quality

Corbett, Edward S., James A. Lynch, and William E. Sopper.  
1978. Timber harvesting practices and water quality in the eastern United States. *J. For.* 76(8):484-488. (NE)

Curtis, Willie R.  
1976. Sampling for water quality. U.S. Dep. Comm. Natl. Bur. Stand. Spec. Publ. 464:237-244. (NE)

Duffy, Paul D., Jonathon D. Schreiber, Douglas C. McClurkin, and Leslie L. McDowell.  
1978. Aqueous- and sediment-phase phosphorus yields from five southern pine watersheds. *J. Environ. Qual.* 7(1):45-50. (SO)

## Watershed Measurements and Evaluation

- Bird, Kenneth G.  
1977. Extending service intervals for drum-type meteorological instruments. U.S. Dep. Agric. For. Serv. Note RM-350. 4 p. (RM)
- Carter, D. Ross, Frederic R. Larson, James J. Rogers, and others.  
1977. Ecosystem analysis for watershed management. *In* 21st Annu. Ariz. Watershed Symp. Proc. Rep. 9. (RM)
- Ffolliott, Peter F.  
1978. A multi-functional inventory approach to multiple use analysis. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55. p. 395-402. (RM)
- Ponce, V. M., R. M. Li, and D. B. Simons.  
1978. Applicability of kinematic and diffusion models. Hydraul. Div. Am. Soc. Civil Eng. Vol. 104. No. HY3:353-360. (RM)
- Rasmussen, William O., and Peter F. Ffolliott.  
1978. Error processing systems for integrated resource data. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep., RM-55, p. 328-331. (RM)
- Rasmussen, William O., and Peter F. Ffolliott.  
1978. Should an organization use existing data or collect new? *In* Computer systems in the field workshop proceedings. p. 128-138. Soc. Am. For. and Iowa State Univ. (RM)
- Replogle, J. A., H. Riekerk, and B. F. Swindel.  
1978. Flow metering flumes monitor water in coastal forest watershed. Water and Sewage Works 125(7):64-67. (SE)
- Slaughter, Charles W., and Michael A. Billelo.  
1977. Kolyrna water balance station, Magadan Oblast, Northeast U.S. S.R. United States-Soviet scientific exchange visit. Cold Reg. Res. and Eng. Lab. Spec. Rep. 75-15. 66 p., illus. U.S. Army Corps Eng. (PNW)
- Slaughter, Charles W., and Michael Billelo.  
1978. Subarctic watershed research in the Soviet Union. Arctic Bull. 2(3):305-313, illus. (PNW)
- Slaughter, Charles W., and Frederick B. Lotspeich.  
1977. Caribou-Poker Creeks research watershed. Arctic Bull. 2(10): 182-188. (PNW)
- Slaughter, C. W., and H. S. Santeford.  
1975. High-latitude research basins as settings for circumpolar environmental studies. *In* Circumpolar conference on northern ecology proceedings, p. IV-57 to IV-68. Nat. Res. Council. Can. (PNW)

Smith, W. H., and B. F. Swindel.

1978. A research program to investigate impacts of forest management practices on multiple forest values. IMPAC Rep. 3(1):18. (SE)
- Sopper, W. E., J. A. Lynch, and E. S. Corbett.  
1976. A water problem analysis related to the forest-urban interface. Northeast. For. Exp. Stn. Gen. Tech. Rep. (NE)
- Tiedemann, Arthur R., and Glen O. Klock  
1977. Meeks table research natural area - reference sampling and habitat classification. U.S. Dep. Agric. For. Serv. Res. Pap. PNW-223. 19 p., illus. (PNW)
- Williams, T. M.  
1978. An approach to measuring runoff from forested coastal watersheds. IMPAC Rep. 3(4):11. (SE)
- Wilson, Dale, Walter F. Megahan, Bill Russell, and Mel Bennett.  
1977. A systematic watershed analysis procedure for the Clearwater National Forest. *In* Proc. Natl. Mat. Eng. Workshop, 11 p. (INT)
- Ziemer, Robert R., and David Strauss.  
1978. A statistical approach to instrument calibration. U.S. Dep. Agric. For. Serv. Eng. Manage. 7100-11. 29 p. (PSW)

## Wildlife, Range, and Fisheries Habitat

### Fisheries Habitat

- Alexander, Gaylord R., and E. A. Hansen.  
1977. The effects of sediment from a gas-oil well drilling accident on trout in the Williamsburg area, Michigan. Mich. DNR Fish. Res. Rep. 1851, 15 p. (NC)
- Busdosh, M., Mike McSorley, and John N. Rinne.  
1978. Age and growth of channel catfish, *Ictalurus punctatus*, in the Salt River, Arizona. J. Ariz. -Nev. Acad. Sci. 13(2):35-28. (RM)
- Harshbarger, T. J.  
1978. Factors affecting regional trout stream productivity. *In* Proc. Southeast. Trout Resour. Ecol. Manage. Symp., p. 11-27. (SE)
- Hawkes, Clifford L.  
1978. Aquatic habitat of coal and bentonite clay strip mine ponds in

the northern Great Plains. (Abstr.) In International Congress for energy and the ecosystem: economics, ecology and planning of Coal Resource Development. Univ. N. Dak. (RM)

Hawkes, Clifford L., and Logan A. Norris.

1977. Chronic oral toxicity of 2, 3, 7, 8-Tetrachlorodibenzo-p-dioxin (TCDD) to rainbow trout. Trans. Am. Fish. Soc. 106(6):641-645. (RM)

Knight, Robert William.

1977. Streamside erosional response to animal grazing practices on Meadow Creek in northeastern Oregon. M.S. thesis, Oreg. State Univ. 59 p. (PNW)

Meehan, William R., and Douglas N. Swanson.

1977. Effects of gravel morphology on fine sediment accumulation and survival of incubating salmon eggs. U.S. Dep. Agric. For. Serv. Res. Pap. PNW-220, 16 p., illus. (PNW)

Meehan, William R., Frederick J. Swanson, and James R. Sedell.

1977. Influences of riparian vegetation on aquatic ecosystems with particular reference to salmonid fishes and their food supply. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-43, p. 137-145. (PNW)

Minckley, W. L., John N. Rinne, and James E. Johnson.

1977. Status of the Gila topminnow (*Poeciliopsis O. occidentalis*) and its co-occurrence with mosquitofish (*Gambusia affinis*). U.S. Dep. Agric. For. Serv. Res. Pap. RM-198, 8 p. (RM)

Platts, William S., and Susan B. Martin.

1978. Hydrochemical influences of the fishery within the phosphate mining area of Eastern Idaho. U.S. Dep. Agric. For. Serv. Res. Note INT-246, 15 p. (INT)

Platts, William S., and Fred E. Partridge.

1978. Rearing of chinook salmon in tributaries of the South Fork Salmon River, Idaho. U.S. Dep. Agric. For. Serv. Res. Pap. INT-205, 11 p. (INT)

Rinne, John N.

1978. Development and applicability of methods of population and habitat evaluation for Arizona and Gila trouts. In Proc. Wild Trout-catchable Trout Symp. (RM)

Rinne, John N.

1978. Standing crops of Chironomidae and Tubificidae in two desert reservoirs, central Arizona. Hydrobiologia 57(3):217-224. (RM)

Swanston, Douglas N., William R. Meehan, and James A. McNutt.

1977. A quantitative geomorphic approach to predicting productivity of pink and chum salmon streams in southeast Alaska. U.S. Dep.

Agric. For. Serv. Res. Pap. PNW-227, 26 p., illus (PNW)

## Range

Anderson, David C.

1978. Cryptogamic soil crusts: factors influencing their development in Utah deserts and their recovery from grazing on Utah winter ranges Ph.D. Diss. Brigham Young Univ. (INT)

Brown, Ray W., and Walter T. McDonough.

1977. Thermocouple psychrometer for *in situ* leaf water potential determinations. Plant and Soil 48:5-10. (INT)

Burdick, Donald J., and Craig Husegawa.

1978. Adelid larvae from the San Joaquin Experimental Range, Madera Co., California. Pan-Pac. Entomol. 54(1):77. (PSW)

Clary, Warren P.

1978. Arizona fescue mountain rangelands. (Abstr) p. 22. In 1st Int. Rangeland Congr. (INT)

Clary, Warren P., and Harold E. Grelen.

1978. A comparison of the beef gain potentials of a cool semiarid pine forest range and a subtropical pine forest range. (Abstr.) p. 55. In Proc. 1st Int. Rangeland Congr. (SO)

Clary, Warren P., Peter F. Ffolliott, and Frederic R. Larson.

1978. Factors affecting forage consumption by cattle in Arizona ponderosa pine forests. J. Range Manage. 31(1):9-10. (RM)

Copple, R. F., and C. P. Pase.

1978. A vegetative key to some common Arizona range grasses. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-53, 106 p. (RM)

Everett, R. L., R. O. Meeuwig, P. T. Tueller, and R. A. Evans.

1977. Water potential in sagebrush and shadscale communities. Northwest Sci. 51:271-281. (INT)

Everett, R. L., R. O. Meeuwig, and R. Stevens.

1978. Deer mouse preference for seed of commonly planted species, indigenous weed seed, and sacrifice foods. J. Range Manage. 31:70-73. (INT)

Ffolliott, Peter F., Warren P. Clary, and William H. Kruse.

1978. Effects of grazing on multiple use values of a cleared ponderosa pine watershed. (Abstr.) p. 46. In 31st Annu. Meet., Soc. Range Manage. (INT)

- Ffolliott, Peter F., Ronald E. Thill, Waren P. Clary, and Frederick R. Larson.  
1977. Animal use of ponderosa pine forest openings. *J. Wildl. Manage.* 41(4):782-784. (RM)
- Garrison, George A., Ardell J. Bjugstad, Donald A. Duncan, and others.  
1977. Vegetation and environmental features of forest and range ecosystems of the United States. U.S. Dep. Agric., Agric. Handb. 475, 68 p. (RM)
- Grelen, Harold E., and Richard E. Lohrey.  
1978. Herbage yield related to basal area and rainfall in a thinned longleaf plantation. U.S. Dep. Agric. For. Serv. Res. Note SO-232, 4 p. (SO)
- Grelen, Harold E., and Clifford E. Lewis.  
1978. Multi-resource inventories: a potential of the forest survey. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55, p. 425-429. (SO)
- Grelen, Harold E.  
1978. May burns stimulate growth of longleaf pine seedlings. U.S. Dep. Agric. For. Serv., Res. Note SO-234, 5 p. (SO)
- Grelen, Harold E.  
1978. Forest grazing in the south. *J. Range Manage.* 31:244-250. (SO)
- Grelen, Harold E.  
1978. Comparison of winter and spring prescribed fires on Louisiana pine-bluestem range. (Abstr.) p. 25. *In Proc. 1st Int. Rangeland Congr. Soc. Range Manage.* 68 p. (SO)
- Klemmedson, J. O., Rex D. Pieper, Don D. Dwyer, and others.  
1978. Research needs on western rangelands. *J. Range Manage.* 31:4-8. (INT)
- Larson, Jeanne R., and Don A. Duncan.  
1978. Annual grassland responses to wildfire and air-dropped fire retardant. (Abstr.) p. 20-21. *In 31st Annu. Meet. Soc. For. Range Manage.* (PSW)
- Lewis, Clifford E.  
1978. Principles and status of integrated management from the range viewpoint. *In Mutual opportunities for forest, range and wildlife management, a symposium.* Sch. For. Res. and Conserv., Fla. Univ. Resour. Rep. 4(1977):26-34. (SE)
- Lewis, Clifford E.  
1978. Inventory and forage capability determination, p. 9-19. *Proc. Coop. For. Manage. Tech. Train. Fla. Div. For.* (SE)
- Martin, S. Clark.  
1978. The Santa Rita Grazing System. *In Proc. 1st Int. Rangeland Congr.* (RM)
- Martin, S. Clark.  
1978. Grazing systems — what can they accomplish? Rangeland's *J.* 5(1):14-16. (RM)
- Martin, S. Clark, and Raymond M. Turner.  
1977. Vegetation change in the Sonoran Desert region, Arizona and Sonora. *J. Ariz. Acad. Sci.* 12(2):59-62. (RM)
- McArthur, E. D., B. L. Welch, and R. Stevens.  
1978. Growth rates of *Artemisia tridentata* subspecies. (Abstr.) p. 26-27. *In 31st Annu. Meet. Soc. Range Manage.* 64 p. (INT)
- McArthur, E. D., A. P. Plummer, G. A. Van Epps, and others.  
1978. Producing fourwing saltbush in seed orchards. (Abstr.) p. 38. *In 1st Int. Rangeland Congr., Soc. Range Manage.* 68 p. (INT)
- McArthur, E. D., and A. P. Plummer.  
1978. Biogeography and management of native western shrubs: a case study, section *Tridentatae* of *Artemisia*. *Great Basin Nat. Mem.* 2:229-243. (INT)
- McArthur, E. D., D. L. Hanks, A. P. Plummer and A. C. Blauer.  
1978. Contributions to the taxonomy of *Chrysothamnus viscidiflorus* (Asteraceae, Compositae) and other *Chrysothamnus* species using paper chromatography. *J. Range Manage.* 31:216-223. (INT)
- McDonough, W. T.  
1977. Seed physiology. *In Rangeland plant physiology.* Soc. Range Manage., Range Sci. Ser. 4:155-184. (INT)
- Moden, W. L., Jr., D. W. McKenzie, and R. Stevens.  
1978. Interseeder for rocky and brushy terrain (progress report). U.S. Dep. Agric. For. Serv., Equip. Develop. Cent., San Dimas, Calif. 8 p. (INT)
- Murray, R. B., H. F. Mayland, and P. J. Van Soest.  
1978. Growth and nutritional value to cattle of grasses on cheatgrass range in southern Idaho. U.S. Dep. Agric. For. Serv. Pap. INT-199, 57 p. (INT)
- Munn, L. C., G. A. Nielson, and W. F. Muegler.  
1978. Relationships of soils to maintain and foothill range habitat types and production in western Montana. *J. Soil Sci. Soc. Am.* 42:135-139. (INT)
- Muegler, W. F., and D. L. Bartos.  
1977. Grindstone Flat and Bid Flat exclosures — a 41-year record of changes in clearcut aspen communities. U.S. Dep. Agric. For. Serv. Res. Pap. INT-195, p. 10. (INT)

- Monsen, S. B., and A. P. Plummer.  
1978. Plants and treatment for revegetation of disturbed sites in the Intermountain area. *In* The reclamation of disturbed arid lands. p. 155-173. Univ. N. Mex. Press, Albuquerque. 196 p. (INT)
- Monsen, S. B.  
1978. Report of field trials with the scarifier/seeder. p. 17-19. *In* 32nd Annu. Rep. Veg. Rehab. workshop. 60 p. (INT)
- Monsen, S. B.  
1978. Backpack seed collector. p. 13. *In* 32d Annu. Rep. Veg. and Rehab. workshop. 60 p. (INT)
- Pase, Charles P., and Carl Eric Granfelt, tech. coord.  
1977. The use of fire on Arizona rangelands. Ariz. Interagency Range Comm. Publ. 4, 15 p. (RM)
- Pase, C. P., and O. D. Knipe.  
1977. Effect of winter burning on herbaceous cover on a converted chaparral watershed. *J. Range Manage.* 30(5):346-348. (RM)
- Pearson, Henry A.  
1977. Interrelationships — range, timber, and wildlife. *In* Forests for people: a challenge in world affairs, p. 137-138. Proc. Soc. of Am. For. 1977 Natl. Conv. (SO)
- Pearson, Henry A.  
1977. Grazing cattle on forest range: nutrition and returns. *In* Beef crisis emphasizes value of range. Inst. Food and Agric. Sci. Univ. Fla. Res. Rep. 4:18-22. (SO)
- Plummer, A. P., S. B. Monsen, and R. Stevens.  
1977. Intermountain range plant names and symbols. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. INT-38. 82 p. (INT)
- Schier, George A.  
1978. Variation in suckering capacity among and within lateral roots of an aspen clone. U.S. Dep. Agric. For. Serv. Res. Note INT-241, 7 p. (INT)
- Schier, George A.  
1978. Root suckering in young aspen, girdled, defoliated, and decapitated at various seasons. p. 9. *In* Proc. 5th N. Am. For. Biol. Workshop. (INT)
- Schier, George A., and Robert B. Campbell.  
1978. Effect of cold storage on development of suckers on aspen root cuttings. U.S. Dep. Agric. For. Serv. Res. Note INT-248. 8 p. (INT)
- Schier, George A., and Robert B. Campbell.  
1978. Effect of ethephon on suckering of excised roots and rooting of cuttings in trembling aspen. *For. Sci.* 24:66-72. (INT)
- Schier, George A.  
1978. Vegetative regeneration of trees from roots and rhizomes. *In* Proc. 4th N. Am. For. Biol. Workshop:190. (INT)
- Skovlin, Jon M., and D. Leroy Williamson.  
1978. Bush control and associated tsetse fly problems of rangeland development on the coastal plain of East Africa. (Abstr.) p. 54. *In* 1st Int. Rangeland Congr. Soc. Range Manage. (PNW)
- Stevens, R.  
1978. Interseeder for rocky and brushy areas, p. 6-10. *In* 32d Annu. Rep. Veg. and Rehab. Workshop. 60 p. (INT)
- Tiernan, C. F.  
1978. The role of entomology in range management. (Abstr.) p. 44. *In* 1st Int. Rangeland Congress. Soc. Range Manage. 68 p. (INT)
- Van Epps, G. A.  
1978. Prototype seed harvester for fourwing saltbush, p. 13-14. *In* 32d Annu. Rep. Veg. and Rehab. Workshop. 60 p. (INT)
- Vickery, R. K., Jr., E. D. McArthur, and S. P. Purcell.  
1978. Scrophulariaceae. *In* A. Love IOPB chromosome number rep. LX. Taxon 27:223-231. (INT)
- Welch, B. L.  
1978. Relationship of soil salinity, ash, and crude protein in *Atriplex canescens*. *J. Range Manage.* 31:132-133. (INT)
- Welch, B. L., E. D. McArthur, and D. J. Webber.  
1978. Variation of monoterpenoid content among sources of *Artemisia tridentata* grown in uniform gardens. (Abstr.) p. 26. *In* 31st Annu. Meet. Soc. for Range Manage. 64 p. (INT)
- Wolters, Gale L., Alton Martin, Jr., and Warren P. Clary.  
1977. Timber, browse, and herbage on selected loblolly-shortleaf pine-hardwood forest stands. U.S. Dep. Agric. For. Serv. Res. Note SO-223, 9 p. (SO)
- Young, James A., Raymond A. Evans, and Donald L. Neal.  
1978. Treatment of curleaf cercocarpus seeds to enhance germination. *J. Wildl. Manage.* 42(3):614-620. (PSW)

## Wildlife Management

- Baqai, I. U., and M. Warisuzzaman.  
1977. Taxonomy and relative abundance of some wild animals in southwest of Indus-Delta. *J. Sci.* 3:23-29. (RM)



- Bergstrom, Dorothy.  
1978. Saving snags for woodpeckers. *In* Forestry research: what's new in the West, p. 1-4, illus. (PNW)
- Black, Hugh, Jr., and Jack Ward Thomas.  
1978. Forest and range wildlife habitat management: ecological principles and management systems. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PNW-64, p. 47-56. (PNW)
- Blair, Robert M., and Louis A. Brunett.  
1977. Deer habitat potential of pine-hardwood forests in Louisiana. U.S. Dep. Agric. For. Serv. Res. Pap. SO-136, 11 p. (SO)
- Blair, Robert M., and Donald P. Feduccia.  
1977. Midstory hardwoods inhibit deer forage in loblolly pine plantations. *J. Wildland Manage.* 41:677-684. (SO)
- Blair, Robert M., Henry L. Short, and E. A. Epps, Jr.  
1977. Seasonal nutrient yield and digestibility of deer forage from a young pine plantation. *J. Wildland Manage.* 41:667-676. (SO)
- Bloom, Arthur M.  
1978. Sitka black-tailed deer winter range in the Kadashan Bay area, southeast Alaska. *J. Wildland Manage.* 42(1):108-112. (PNW)
- Bock, Carl E., and Jane H. Bock.  
1978. Response of birds, small mammals, and vegetation to burning sacaton grasslands in southeastern Arizona. *J. Range Manage.* 31(4):296-300. (RM)
- Buech, Richard R., Robert M. Timm, and Karl Siderits.  
1977. A second population of Rock Voles, *Microtus chrotorrhinus*, in Minnesota, with comments on habitat. *Can. Field-Nat.* 91(4):413-414. (NC)
- Buech, Richard R., Karl Siderits, Robert E. Radtke, and others.  
1977. Small mammal populations after a wildfire in northeastern Minnesota. U.S. Dep. Agric. For. Serv. Res. Pap. NC-515, 8 p. (NC)
- Bull, Evelyn L.  
1978. Roosting activities of a male pileated woodpecker. *Murrelet*. Spring 1978, p. 35-36, illus. (PNW)
- Bull, Evelyn L.  
1978. Specialized habitat requirements of birds: snag management, old growth, and riparian habitat. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PNW-64, p. 74-82, illus. (PNW)
- Bull, Evelyn L., and Ralph G. Anderson.  
1978. Notes on flammulated owls in northeastern Oregon. *Murrelet*. Spring 1978, p. 26-27. (PNW)
- Conner, Richard N.  
1978. Snag management for cavity nesting birds. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. SE-14, p. 120-128. (SO)
- Crawford, H. S., and W. L. Stutzman.  
1977. Measuring deer habitat attributes with microwave signal attenuation. *In* Trans. 11th Meet. North. Deer Study Group, Quebec City, P.Q., Sept. 1975:123-132. (NE)
- Cupal, Jerry J., R. W. Weeks, and C. Kaltenback.  
1976. A heart rate-activity biotelemetry system for use on wild big game animals. *In* Biotelemetry III, p. 219-222. *Proc. 3d Int. Symp. on Biotelemetry*, Academic Press, Inc. (RM)
- Currie, P. O., D. W. Reichert, J. C. Malechek, and O. C. Wallmo.  
1977. Forage selection comparisons for mule deer and cattle under managed ponderosa pine. *J. Range Manage.* 30(5):352-356. (RM)
- Cushwa, Charles T., David R. Patton, William R. Mason, and Lawrence J. Slaski.  
1978. RUN WILD East: a computerized data system for fish and wildlife resources. *In* Trans. Northeast. Wildl. Conf. (RM)
- Davis, P. R.  
1977. Mule deer and elk responses to forest fire and clearcutting in southwest Wyoming. *J. Wildlife Manage.* 41(4):785-788. (RM)
- Dawson, Deanna K., and John R. Probst.  
1978. Aspen-birch forest. *Am. Birds* 32(1):65. (NC)
- Dawson, Deanna K., and John R. Probst.  
1978. Aspen clearcut. *Am. Birds* 32(1):79. (NC)
- Dawson, Deanna K., and John R. Probst.  
1978. Mature aspen-northern hardwoods forest. *Am. Birds* 32(1):65-66. (NC)
- Dealy, J. Edward.  
1976. Mule deer habitat research at the La Grande range and wildlife habitat research laboratory. *Interstate Wildl. Study Newsl.* 4:37-39. (PNW)
- Dickson, James G.  
1978. Forest bird communities of the bottomland hardwoods. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. SE-14, p. 66-73. (SO)
- Edgerton, Paul J.  
1978. Impact of big game and cattle on forest succession following logging in a mixed conifer forest, Blue Mountains, Oregon. (Abstr.) p. 22. *Soc. Range Manage.* (PNW-1701, 2)
- Edgerton, Paul J., and Jack Ward Thomas.  
1978. Silvicultural options and habitat values. U.S. Dep. Agric. For.

- Serv. Gen. Tech. Rep. PNW-64. (PNW)  
Evans, Keith E.  
1978. Oak-pine and oak-hickory forest bird communities and management options. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. SE-14, p 76-89. (NC)
- Everett, R. L., R. O. Meeuwig, and R. Stevens.  
1978. Deer mouse preference for seed of commonly planted species, indigenous weed seed, and sacrifice foods. *J. Range Manage.* 31:70-73. (INT)
- Fitzner, R. E., L. E. Rogers, and D. W. Uresk.  
1978. Techniques useful for determining raptor pre-species abundance. *Raptor Res.* 11(3):67-71. (RM)
- Floyd, Theodore J., L. David Mech, and Peter A. Jordan.  
1978. Relating wolf scat content to prey consumed. *Wildl. Manage.* 42(3):528-532. (NC)
- Goodwin, Gregory A.  
1977. Golden eagle predation of pronghorn antelope. *Auk* 94(4):789-790. (RM)
- Goodwin, John G., Jr., and C. Roger Hungerford.  
1977. Habitat use by native Gambel's and scaled quail and released masked bobwhite quail in southern Arizona. U.S. Dep. Agric. For. Serv. Res. Pap. RM-197, 8 p. (RM)
- Grigal, David F., and Lewis F. Ohmann.  
1977. Biomass estimation for some shrubs from northeastern Minnesota. U.S. Dep. Agric. For. Serv. Res. Note NC-226, p. 3. (NC)
- Grubb, Teryl G.  
1978. A summary of current bald eagle research in the southwest. *In* Proceedings of bald eagle days, Jan. 1978. Eagle Valley Environ., Inc. (RM)
- Grubb, Teryl G., and Duane M. Rubink.  
1978. First bald eagle eggs collected for analysis in Arizona. U.S. Dep. Agric. For. Serv. Res. Note RM-352, 2 p. (RM)
- Grubb, Teryl G., and R. J. Hensel.  
1978. Food habits of bald eagles on Kodiak Island, Alaska. Murrelet. Summer 1978, p. 70-72. (RM)
- Grubb, Teryl G.  
1977. The breeding and wintering ecology of eagles in the state of Washington. *In* Proceedings of bald eagle days, Jan. 1977. Eagle Valley Environ. Inc. (RM)
- Halls, Lowell K., ed.  
1977. Southern fruit producing woody plants used by wildlife. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. SO-16. 235 p. (SO)
- Hamel, P. B.  
1977. The wood stork in South Carolina, a review. *Chat* 41(2):24-25. (SE)
- Hardin, Kimberly I., and Keith E. Evans.  
1977. Cavity nesting bird habitat in the oak-hickory forests — a review. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-30. 23 p. (NC)
- Harlow, R. F.  
1977. A technique for surveying deer forage in the Southeast. *Wildl. Soc. Bull.* 5(4):185-191. (SE)
- Harrington, Fred H., and L. David Mech.  
1978. Wolf vocalization. *In* Wolf and man: evolution in parallel. p. 109-132. Academic Press, New York. (NC)
- Healy, William M., and Edward S. Nenno.  
1978. Turkey broods and hairy snoods. *Turkey Call* 5(3):12-17. (NE)
- Hill, Edward P., Douglas N. Lasher, and R. Blake Roper.  
1978. A review of techniques for minimizing beaver and white-tailed deer damage in southern hardwoods. (SO)
- Hinckley, Thomas M., and Keith E. Evans.  
1977. A review of *Polish Ecological Studies*, Vol. 1. *Quart. Rev. Biol. Rev. Biol.* 52(3):315. (NC)
- Hooper, R. G.  
1978. Cove forests: bird communities and management options. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. SE-14, p. 90-97. (SE)
- Knight, Richard, Joseph Basile, Kenneth Greer, and others.  
1977. Yellowstone grizzly bear investigations, annual report of the interagency study team, 1976. U.S. Dep. Inter. Natl. Park Serv. Misc. Rep. 10, 75 p. (INT)
- Leege, T. A., J. R. Nelson, and J. W. Thomas.  
1977. Food habits and diet quality of North American elk. *In* CRC handbook series in nutrition and food, Section G: diets, culture media, food supplements, Vol. I: diets for mammals, p. 221-241. CRC Press, Cleveland. (PNW)
- Lowe, Philip O., Peter F. Ffolliott, John H. Dieterich, and David R. Patton.  
1978. Determining potential wildlife benefits from wildfire in Arizona ponderosa pine forests. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-52, 12 p. (RM)

- Lynch, G. Robert, F. Daniel Vogt, and Harvey R. Smith.  
1978. Seasonal study of spontaneous daily torpor in the white footed mouse, *Peromyscus leucopus*. *Physiol. Zool.* 52(3):289-299.(NE)
- Lyon, L. Jack.  
1978. USDA information requirements for wildlife management. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55, p. 45-52. (INT)
- Maser, Chris, and Jack Ward Thomas.  
1978. Ecosystems, habitats, wildlife, and management. *In* U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PNW-64, p. 1-4. (PNW)
- McCluskey, D. Calvin, Jack Ward Thomas, and E. Charles Meslow.  
1977. Effects of aerial application of DDT on reproduction in house wrens and mountain and western bluebirds. U.S. Dep. Agric. For. Serv. Res. Pap. PNW-228, 22 p., illus. (PNW)
- McMillin, J. Michael, U. S. Seal, Lynn L. Rogers, and A. W. Erickson.  
1976. Annual testosterone rhythm in Black Bear (*Ursus americanus*). *Biol. Reprod.* 15:163-167. (NC)
- Mech, L. David.  
1977. Productivity, mortality and population trend in wolves from northeastern Minnesota. *J. Mammal.* 58(4):559-574. (NC)
- Mech, L. David.  
1977. Record movement of a canadian lynx. *J. Mammal.* 58(4):676-677. (NC)
- Mech, L. David.  
1977. Wolf-pack buffer zones as prey reservoirs. *Science* 198:320-321. (NC)
- Mech, L. David, and Patrick D. Karns.  
1977. Role of the wolf in a deer decline in the Superior National Forest. U.S. Dep. Agric. For. Serv. Res. Pap. NC-148, 23 p. (NC)
- Milchunas, Daniel G., Melvin I. Dyer, Olof C. Wallmo, and Donald E. Johnson.  
1978. *In Vivo/In Vitro* relationships of Colorado mule deer forages. *Colo. State Div. of Wildl. Spec. Rep.* 43. 44 p. (RM)
- Nellis, C. H., and Dean E. Medin.  
1978. Models and wildlife. *Idaho Wildl.* 1(3):27-28. (INT)
- Ohmann, Lewis F., and David F. Grigal.  
1977. Some individual plant biomass values from northeastern Minnesota. U.S. Dep. Agric. For. Serv. Res. Note. NC-227, p. 2. (NC)
- Ohmann, Lewis F., David F. Grigal, and Robert B. Brander.  
1978. Shrub mass: date variability and changes over time, p. 172-214. *In* 10th North Am. Moose Conf. and Workshop Proc. Minn. Dep. Nat. Res. 316 p. (NC)
- Patton, David R.  
1978. RUNWILD: a storage and retrieval system for wildlife habitat information. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-51, 8 p. (RM)
- Post, William, and James W. Wiley.  
1977. Reproductive interactions of the shiny cowbird and the yellow-shouldered black-bird. *Condor* 79(2):176-184. (SO)
- Post, William, and James W. Wiley.  
1977. The shiny cowbird in the West Indies. *Condor* 79(1):119-121. (SO)
- Powell, Roger A.  
1978. A comparison of Fisher and Weasel hunting behavior. *Carnivore* 1(1):28-34. (NC)
- Probasco, George E.  
1978. Bird habitat-woody plant relations on Missouri limestone glades. *In* 5th midwest prairie conference proceedings, p. 107-109. Iowa State Univ. (NC)
- Probasco, G. E., and A. J. Bugstad.  
1978. Nutrition and *In vitro* digestibility of tall fescue for white-tailed deer, May through November. U.S. Dep. Agric. For. Serv. Res. Note NC-228, 3 p. (RM)
- Probasco, George E., and Charles W. Putnam.  
1977. A turkey vulture nest in Missouri. *Bluebird* 44:14. (NC)
- Puglisi, M. J., S. A. Liscinsky, and R. F. Harlow.  
1978. An improved methodology of rumen content analysis for white-tailed deer. *J. Wildl. Manage.* 42(2):398-403. (SE)
- Pyle, R. L., and C. J. Ralph.  
1978. The winter season: Hawaiian Islands region. *Am. Birds* 32(2):265-267. (PSW)
- Radwan, M. A., and G. L. Crouch.  
1977. Seed germination and seedling establishment of redstem ceanothus. *J. Wildl. Manage.* 11:760-766. (RM)
- Raisanen, R. A., and J. K. Werner.  
1977. A survey of fishes of the McCormick Forest. U.S. Dep. Agric. For. Serv. Res. Pap. NC-147, 10 p. (NC)
- Ralph, C. J.  
1978. Hawaiian plant on endangered species list. *'Elepaio* 38(12):142-143. (PSW)
- Ralph, C. J., and R. L. Pyle.  
1977. The summer season: Hawaiian Islands region. *Am. Birds* 31(5):1049-1050. (PSW)

- Ralph, C. J., and R. L. Pyle.  
1977. The fall season: Hawaiian Islands region. *Am. Birds* 31(6):1192-1193. (PSW)
- Ralph, C. J., and R. L. Pyle.  
1978. The spring season: Hawaiian Islands region. *Am. Birds* 32(3):402-403. (PSW)
- Regelin, Wayne L., and Olof C. Wallmo.  
1978. Duration of deer forage benefits after clearcut logging of subalpine forest in Colorado. U.S. Dep. Agric. For. Serv. Res. Note. RM-356, 4 p. (RM)
- Renwald, J. David, Henry A. Wright, and Jerran T. Flinders.  
1978. Effect of prescribed fire on bobwhite quail habitat in the rolling plains of Texas. *J. Range Manage.* 31(1):65-69. (RM)
- Rodgers, Kenneth J., Peter F. Ffolliott, and David R. Patton.  
1978. Home range and movement of five mule deer in a semidesert grass-shrub community. U.S. Dep. Agric. For. Serv. Res. Note RM-355, 6 p. (RM)
- Rogers, Lynn L.  
1977. The fourth international conference on bear research and management—a review. *Wildl. Soc. Bull.* 5(4):38. (NC)
- Schitoskey, Frank Jr., and Sarah Woodmansee.  
1978. Energy requirements and diet of the California ground squirrel. *J. Wildl. Manage.* 42(2):373-382. (PSW)
- Schoenfeld, Clarence A., and John C. Hendee.  
1978. Wildlife management in wilderness. The Boxwood Press, Pac. Grove, Calif. 172 p., illus. (PNW)
- Schultz, J. L.  
1978. Bird consumption of scarlet elder fruit in Michigan's Upper Peninsula. *Jack-Pine Warbler* 56(1):3-7. (NC)
- Schumacher, Robert W., Gregory T. Koeln, Bently Wigley, and David E. Wesley.  
1977. Wild turkey nest location using telemetry. *In Proc. 1st Int. Conf. on Wildl. Biotelemetry*, p. 101-108. (SO)
- Schumacher, Robert W., Carroll J. Perkins, Alfred D. Sullivan, and David E. Wesley.  
1978. Heat-shrinkable tubing as a means of securing harness knots. *J. Wildl. Manage.* 42:685-686. (SO)
- Scott, Virgil E., Keith E. Evans, David R. Patton, and Charles P. Stone.  
1977. Cavity-nesting birds of North American forests. U.S. Dep. Agric., Agric. Handb. 511. 112 p. (RM)
- Severson, Keith E., and Charles E. Boldt.  
1978. Cattle, wildlife, and riparian habitats in the western Dakotas. *In* *Management and use of Northern Plains rangeland proceedings*. Reg. Rangeland Symp. Soc. Range Manage. OWRC/NDSU Coop. Ext. Serv., Fargo, N. Dak. (RM)
- Severson, Keith E., and Charles E. Boldt.  
1978. Problems associated with management of native woody plants in western Dakotas, p. 51-57. *In Proc. 6th Wyo. Shrub Ecol. Workshop*. (RM)
- Short, Henry L., Wain Evans, and Erwin L. Boeker.  
1977. The use of natural and modified pinyon pine juniper woodlands by deer and elk. *J. Wildl. Manage.* 41(3):543-559. (RM)
- Short, Henry L., and Clay Y. McCulloch.  
1977. Managing pinyon-juniper ranges for wildlife. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-47. 10 p. (RM)
- Short, Henry L.  
1978. Analysis of cuticular scales on hairs using the scanning electron microscope. *J. Mammal.* 59(2):261-268. (RM)
- Skinner, T. H., and J. O. Klemmedson.  
1978. Abert squirrels influence nutrient transfer through litterfall in a ponderosa pine forest. U.S. Dep. Agric. For. Serv. Res. Note RM-353, 8 p. (RM)
- Skovlin, J. M., and M. Vavra.  
1978. Winter diets of deer and elk in northeastern Oregon. (Abstr.) p. 53. *In* 31st Annu. Meet. Soc. Range Manage. (PNW)
- Smith, Harvey R., and Robert W. Campbell.  
1978. Woodland mammals and the gypsy moth. *Am. For.* 84(5):22-25. (NE)
- Stransky, John J., and Lowell K. Halls.  
1977. Browse quality affected by pine site preparation in east Texas. *In Proc. Annu. Conf. Southeast. Assoc. Fish Wild. Agencies* (1976) 30:507-512. (SO)
- Thomas, Jack Ward, Chris Maser, and Jon E. Rodiek.  
1978. Edges—their interspersions, resulting diversity and its measurement. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PNW-64, p. 91-100, illus. (PNW)
- Uresk, D. W.  
1978. Diets of the black-tailed hare in steppe vegetation. *J. Range Manage.* 31(6):447-450. (RM)
- Uresk, D. W.  
1978. Ingestion of radioiodine by range cattle. *In* *Ecological northwest report*, p. 2.34. Dep. Energy. (RM)

- Uresk, D. W.  
1978. Nesting ecology of the burrowing owl. *In* Ecological sciences. Part II. Pac. Northwest Rep. Dep. Energy. (RM)
- Uresk, D. W.  
1978. Primary plant productivity response in 1977 drought. *In* Ecological sciences. Pac. Northwest Rep. Dep. Energy. (RM)
- Uresk, D. W., and V. A. Uresk.  
1978. Diets of mule deer within steppe vegetation of south central Washington. (Abstr.) *In* 31st Annu. Meet. Soc. Range Manage. p. 53. (RM)
- Uresk, D. W., W. H. Rickard, and J. F. Cline.  
1978. Response of shrub-steppe vegetation after a wildfire. (Abstr.) p. 21. *In* 31st Annu. Meet. Soc. Range Manage. (RM)
- Uresk, D. W., W. H. Rickard, and J. F. Cline.  
1978. Response of three perennial grasses after a wildfire. (Abstr.) p. 27. *In* Am. Assoc. Adv. Sci.—So. c Am. For. Annu. Meet. (RM)
- Uresk, D. W., W. H. Rickard, J. F. Cline, and D. Paine.  
1978. Multivariate analysis of factors affecting mineral cycling and biomass in disturbed areas. (Abstr.) p. 23. *In* 31st Annu. Meet. Soc. Range Manage. (RM)
- Verner, Jared.  
1978. California condors: status of the recovery effort. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. 28, 30 p. (PSW)
- Wallmo, Olof C., Dale F. Reed, and Len H. Carpenter.  
1976. Alteration of mule deer habitat by wildfire, logging, highways, housing developments, and agriculture. *In* Mule deer decline in the west: a symposium. p. 37-47. Utah State Univ. 134 p. (RM)
- West, N. E., R. J. Tausch, K. H. Rea, and P. T. Tueller.  
1978. Phytogeographical variation within pinyon-juniper woodlands of the Great Basin. *In* Intermountain biogeography: a symposium. Great Basin Nat. Memoirs 2:119-136. Brigham Young Univ. (INT)
- West, N. E., R. J. Tausch, K. H. Rea, and P. T. Tueller.  
1978. Taxonomic determination, distribution, and ecological indicator values of sagebrush within the pinyon-juniper woodlands of the Great Basin. *J. Range Manage.* 31:87-92. (INT)
- West, Stephen D.  
1977. Midwinter aggregation in the northern red-backed vole, *Clethrionomys rutilus*. *Can. J. Zool.* 55(9):1404-1409, illus. (PNW)
- West, Stephen D.  
1977. Manipulative behavior by a red squirrel. *Can. Field-Nat.* 91:417-418, illus. (PNW)
- Wilson, Nixon, and Evelyn Bull.  
1977. Ectoparasites found in the nest cavities of pileated woodpeckers in Oregon. *Bird-Band.* 48(2):171-173. (PNW)
- Wolff, Jerry O.  
1978. Burning and browsing effects on willow growth in interior Alaska. *J. Wildl. Manage.* 42(1):135-140, illus. (PNW)
- Wolff, Jerry O.  
1978. Food habits of snowshoe hares in interior Alaska. *J. Wildl. Manage.* 42(1):148-153, illus. (PNW)
- Wolff, Jerry O.  
1977. Habitat utilization of snowshoe hares in interior Alaska. Ph. D. thesis, Univ. Calif., Berkeley. 150 p. (PNW)
- Wolff, Jerry O.  
1977. Return of the snowshoe hare. *Alaska Mag.*, April. p. 60, 96. (PNW)
- Yeatman, Harry C.  
1978. Research trapping. *Fur-Fish-Game.* 74(2):51-52. (SO)
- Zeilemaker, C. F., and C. J. Ralph.  
1977. First breeding record of Laysan albatross on Kauai. *'Elepaio* 38(5):51-53. (PSW)

## FIRE AND ATMOSPHERIC SCIENCES

### Atmospheric/Fire Interactions

- Anderson, Hal E., Robert D. Schuette, and Robert W. Mutch.  
1978. Timelag and equilibrium moisture content of ponderosa pine needles. U.S. Dep. Agric. For. Serv. Res. Pap. INT-202, 28 p. (INT)
- Arno, Stephen F., and Kathy M. Sneek.  
1977. A method for determining fire history in coniferous forests in the Mountain West. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. INT-42, 28 p. (INT)
- Barney, Richard J., Nonan V. Noste, and Ralph A. Wilson.  
1978. Rates of spread of wildfire in Alaskan fuels. U.S. Dep. Agric. For. Serv. Res. Note PNW-311. 12 p., illus. (PNW) (INT)



- Baughman, R. G., and C. W. Schmid, Jr.  
1977. Alaskan lightning storm characteristics. U.S. Dep. Agric. For. Serv. Res. Note INT-235. 6 p. (INT)
- Bergland, Erwin R., and Richard J. Barney.  
1977. Air temperature and wind profiles in an Alaskan lowland black spruce stand. U.S. Dep. Agric. For. Serv. Res. Note PNW-305. 12 p. (INT) (PNW)
- Clements, Hubert B.  
1977. Lift-off of forest firebrands. U.S. Dep. Agric. For. Serv. Res. Pap. SE-159. 11 p. (SE)
- DeBano, Leonard F., P. H. Dunn, and C. E. Conrad.  
1977. Fire's effect on physical and chemical properties of chaparral soils. U.S. Dep. Agric. For. Serv., Gen. Tech. Rep. WO-3, p. 65-75. (RM)
- Fosberg, Michael A.  
1977. Heat and water transport properties in conifer duff and humus. U.S. Dep. Agric. For. Serv. Res. Pap. RM-195. 10 p. (RM)
- Frandsen, William H., and Robert D. Schuette.  
1978. Fuel burning rates of downward versus horizontally spreading fires. For. Serv. Res. Pap. (INT)
- Fuquay, Donald M.  
1978. Predicting ignition of forest fuels by lightning, p. 32-37. Am. Meteorol. Soc. (INT)
- Furman, R. Williams.  
1978. A drought analysis for planning. In 5th joint conference fire and forest meteorology proceedings. Am. Meteorol. Soc. (RM)
- Furman, R. Wm.  
1978. Time series analysis of daily maximum temperatures on a mountain slope. J. Appl. Meteorol. 17(1):110-115. (RM)
- Guardado, J. L., and W. T. Sommers.  
1977. Interpolation of unevenly spaced data using a parabolic leapfrog correction method and cubic splines. U.S. Dep. Agric. For. Serv. Res. Note PSW-324. 5 p. (PSW)
- Haines, Donald A., and John S. Frost.  
1978. Weathering effects on moisture sticks: corrections and recommendations. U.S. Dep. Agric. For. Serv. Res. Pap. NC-154. 7 p. (NC)
- Haines, Donald A., and William A. Main.  
1978. Variation of six measures of fire activity associated with drought. In 5th national conference on fire and forest meteorology proceedings, Am. Meteorol. Soc., p. 5-7. (NC)
- Harvey, A. E., M. F. Jurgensen, and M. J. Larsen.  
1978. Seasonal distribution of ectomycorrhizae in a mature Douglas-fir/larch forest soil in western Montana. For. Sci. 24:203-208. (INT)
- Heisler, Gordon M.  
1977. Trees modify metropolitan climate and noise. J. Arboric. 3(11):201-207. (NE)
- Howard, E. A., III.  
1978. A sample model for estimating the moisture content of living vegetation as potential wildfire fuel. In 5th joint conference on fire and forest meteorology proceedings. Am. Meteorol. Soc. (RM)
- Judson, Arthur.  
1977. Climatological data from the Berthoud Pass area of Colorado. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-42. 94 p. (RM)
- Kessell, S. R., and P. J. Cattellino.  
1978. Evaluation of a fire behavior information integration system for southern California chaparral wildlands. Environ. Manage. 2(2):135-157. (PSW)
- Kessell, S. R., P. J. Cattellino, and M. W. Potter.  
1977. A fire behavior information integration system for southern California chaparral. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. WO-3, p. 354-360. (INT)
- Lavdas, Leonidas G.  
1978. Plume rise from prescribed fires. In 5th national conference on fire and forest meteorology proceedings. p. 88-91. Am. Meteorol. Soc. (SE)
- Little, Silas.  
1978. Fire effects in New Jersey's Pine Barrens. Frontiers 42(2):29-32. (NE)
- Mehring, Peter J., Jr., Stephen F. Arno, and Kenneth L. Petersen.  
1977. Postglacial history of Lost Trail Pass Bog, Bitterroot Mountains, Montana. Arctic and Alpine Res. 9:345-368. (INT)
- Miller, D. R.  
1977. Structure of the microclimate at the woodland/parking lot interface. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-25, p. 109-114. (NE)
- Miller, Melanie.  
1978. Effect of growing season on sprouting of blue huckleberry. U.S. Dep. Agric. For. Serv. Res. Note INT-240. 8 p. (INT)
- McCutchan, Morris H.  
1977. Diagnosing the diurnal variation of surface temperature by using the maximum and minimum temperature. In Preprint vol., Conference on Sierra Nevada Meteorology, Am. Meteorol. Soc., p. 5-10. (PSW)

- McCutchan, Morris H.  
1977. Prediction of synoptic weather types in southern California, p. 31-36. *In* Preprints Proc. 5th Conf. Prob. and Stat. Atmos. Sci., Am. Meteorol. Soc. (PSW)
- McMahon, Charles K.  
1977. Effects of forest fire emissions on air quality, p. 75-81. *In* Proc. Fire by Presc. Symp. 127 p. (SE)
- McMahon, Charles K., and Skevos N. Tsoukalas.  
1978. Polynuclear aromatic hydrocarbons in forest fire smoke. *In* Carcinogenesis, vol. 3: polynuclear aromatic hydrocarbons, p. 61-73. Raven Press, New York. (SE)
- McKee, Thomas B., and C. David Whiteman.  
1977. Components of infrared net radiation in a mountain valley. Atmos. Sci. Pap. 279, Dep. Atmos. Sci., Colo. State Univ. (RM)
- Paul, James T.  
1977. Forestry weather interpretations system (FWIS): a report to the southern fire chiefs, p. 72-86. *In* Proc. South. Fire Chiefs Meet. (SE)
- Paul, James T.  
1977. Localized weather interpretations for southern forestry. South. Lumberman 235(2920):97-98. (SE)
- Paul, James T.  
1978. Forestry weather interpretations system (FWIS): a cooperative experiment in weather for forestry. *In* 5th national conference on fire and forest meteorology proceedings, p. 71-78. Am. Meteorol. Soc. (SE)
- Paul, James T.  
1978. New system will localize and interpret weather information for nurserymen. *In* Proc. 1976 Southeast. Area Nurserymen's Conf. p. 110-122. Ala. For. Comm., Charleston, S.C. (SE)
- Runing, Steven W.  
1978. A process oriented model for live fuel moisture. *In* 5th joint conference on fire and forest meteorology proceedings. Am. Meteorol. Soc. (RM)
- Ryan, B. C.  
1977. Computation of times of sunrise, sunset, and twilight in or near mountainous terrain. U.S. Dep. Agric. For. Serv. Res. Note PSW-322, 4 p. (PSW)
- Ryan, B. C., and J. G. Brown  
1978. Influences on winds in mountainous terrain. *In* Preprint vol., Conference on Sierra Nevada Meteorology. Am. Meteorol. Soc. p. 46-52. (PSW)
- Sommers, W. T.  
1978. LFM forecast variables related to Santa Ana wind occurrences. Mon. Wea. Rev. 106(9):1307-1316. (PSW)
- Sommers, W. T.  
1978. On forecasting strong mountain downslope winds, p. 38-45. *In* Preprints, Proc. 5th Natl. Conf. Fire and For. Meteorol. (PSW)
- Sommers, W. T.  
1978. Strong mountain downslope wind field experiment using surface station, monostatic acoustic sounder, and rawinsonde observations. p. 339-344. *In* Preprints, Proc. 4th Symp. on Meteorol. Obs. and Instrum. (PSW)
- Thompson, Rita P., and Alan R. Taylor.  
1977. The environmental significance of fire. Biol. Dig. 4(3):11-23. (INT)
- Wilson, R. A., and Merlin L. Brown.  
1977. Variation in char density on laboratory fuels. For. Serv. Res. Note (INT)

## Fire Management Systems

- Albini, Frank A., and James K. Brown.  
1978. Predicting slash depth for fire modeling. For. Ser. Res. Pap. (INT)
- Albini, F. A., G. N. Korovin, and E. H. Gorovaya.  
1978. Mathematical analysis of forest fire suppression. For. Serv. Res. Pap. (INT)
- Barney, Richard J.  
1978. Integrating fire with land management planning and action—a process. Am. For. 65:28-31. (INT)
- Chase, Richard A.  
1977. FIRESCOPE: A regional solution to multi-agency coordination problems. Int. Fire Chief 43(9):18-21. (PSW)
- Chase, Richard A.  
1977. "T" cards provide versatile resource status system. Fire Manage. Notes 38(3):12-13. (PSW)
- Deeming, John E.  
1978. Fire behavior: how to predict it. *In* Proc. Prairie prescribed burning symp. and workshop. (INT)
- Dieterich, John H.  
1977. Fire problems and progress in Chile. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. WO-3, p. 342-347. (RM)

- Donoghue, Linda R.  
1978. Forest fire reporting by the northeastern States. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-43, 8 p. (NC)
- Fosberg, Michael A.  
1978. Report on 5th joint conference on fire and forest meteorology, AMS and SAF, 14-16 March, 1978. Bull. Am. Meteorol. Soc. 59(7): 823-824. (RM)
- Fosberg, Michael A.  
1978. Weather in wildland fire management: the fire weather index. *In* Proc. Conf. on Sierra Nev. Meteorol. 4 p. (RM)
- Furman, R. William.  
1978. Meteorological data collection and natural resource planning. *In* 5th joint conference on fire and forest meteorology proceedings. Am. Meteorol. Soc. (RM)
- Furman, R. William.  
1978. Wildfire zones on a mountain ridge. Annu. Asso. Am. Geogr. 68(1):89-94. (RM)
- George, C. W.  
1978. Current trends in the aerial application of fire retardants. Can. Aeronaut. and Space J. 24(3):150-158. (INT)
- George, C. W., A. D. Blakely, G. M. Johnson, and others.  
1977. Evaluation of liquid-ammonium polyphosphate fire retardants. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. INT-41, 54 p. (INT)
- Hough, W. A., and F. A. Albini.  
1978. Predicting fire behavior in palmetto-gallberry fuel complexes. U.S. Dep. Agric. For. Serv. Res. Pap. SE-174, 44 p. (SE)
- Kessell, S. R., M. W. Potter, C. D. Bevins, L. Bradshaw, and B. W. Jeske.  
1978. Analysis and application of forest fuels data. Environ. Manage. 2(4):347-363. (INT)
- Lotan, James E.  
1977. Fire Management perspective: USDA Forest Service. West. Wildlands 4(1):9-10. (INT)
- Mobley, Hugh E.  
1977. Introducing the southern forestry smoke management guidebook, p. 91-94. *In* Proc. Fire by Prescr. Symp. (SE)
- McNab, W. Henry  
1977. An overcrowded loblolly pine stand thinned with fire. J. South. Appl. For. 1(1):24-26. (SE)
- Wetherill, G. Richard.  
1978. An inventory of forest fire prevention education programs in the South: a baseline for evaluation, p. 1-11. *In* Proc. Annu. Meet. Rural Soc. Sect. South. Ass. Agric. Sci. Clemson Unit. (SO)
- Fuel Hazards and Risk Reduction**
- Alexander, Martin E.  
1978. Estimating fuel weights of two common shrubs in Colorado lodgepole pine stands. U.S. Dep. Agric. For. Serv. Res. Note RM-354, 4 p. (RM)
- Anholt, Brian F., and J. A. Kendall Snell.  
1978. California regional supplement to handbook for predicting slash weight of western conifers. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. INT-37. (PNW)
- Barney, Richard J., Keith Van Cleve, and Robert Schlenter.  
1978. Biomass distribution and crown characteristics in two Alaskan *Picea Mariana* ecosystems. Can. J. For. Res. 8(1):36-41. (INT)
- Bevins, Collin D.  
1978. Fuel particle diameters of western hemlock slash. U.S. Dep. Agric. For. Serv. Res. Pap. INT-243, 3 p. (INT)
- Brown, James K.  
1978. Weight and density of crowns of Rocky Mountain conifers. U.S. Dep. Agric. For. Serv. Res. Pap. INT-197, 56 p. (INT)
- Fischer, William C.  
1978. Planning and evaluating prescribed fires—a standard procedures. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. INT-43, 19 p. (INT)
- Fischer, William C., and David J. Books.  
1977. Safeguarding Montana's forest homes: lessons from the Pattee Canyon Fire. West. Wildlands 4(1):30-35. (INT)
- Folkman, William S.  
1977. High-fire-risk behavior in critical fire areas. U.S. Dep. Agric. For. Serv. Res. Pap. PSW-125, 12 p. (PSW)
- Gagianas, A. D., and A. R. Berg.  
1977. The effect of morphactin (methyl 2-chloro-9-hydroxyfluorene-9-carboxylate) on basipetal transport of indol-3-ylacetic acid in hypocotyl sections of *Phaseolus vulgaris* L. Ann. Bot. 41:1135-1148. (PSW)
- Green, Lisle R.  
1977. Fuel reduction without fire-current technology and ecosystem impact. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. WO-3, P. 163-171. (PSW)
- Green Lisle R.  
1978. Wildfire, prescribed fire, and fuelbreaks. p. 92-98. *In* Proc. 30th Calif. Weed Conf. (PSW)
- Hough, W. A.  
1978. Estimating available fuel weight consumed by prescribed fires in the South U.S. Dep. Agric. For. Serv. Res. Pap. SE-187, 12 p. (SE)

- Johansen, Ragnar W.  
1977. The "complex" portion of a decision-logic approach to prescribed burning prescriptions for smoke management, p. 95-96. *In* Proc. Fire by Presc. Symp. (SE)
- Johnson, Von J., and W. A. Main.  
1978. A climatology of prescribed burning. *In* Preprint 5th national conference on fire and forest meteorology proceedings, p. 59-62. Am. Meteorol. Soc. (NC)
- Kirby, D. R., and D. A. Bryant.  
1977. Digestibility of tanoak. J. Range Manage. 30(5):349-351. (PSW)
- Kraemer, James F.  
1977. The long term effects of burning on plant succession. M.S. thesis, Oreg. State Univ., Corvallis, 123 p. (PNW)
- Loomis, Robert M.  
1977. Jack pine and aspen forest floors in northeastern Minnesota. U.S. Dep. Agric. For. Serv. Res. Note NC-222, 3 p. (NC)
- Loomis, Robert M.  
1977. Wildfire effects on an oak-hickory forest in southeast Missouri. U.S. Dep. Agric. For. Serv. Res. Note NC-219, 4 p. (NC)
- Martin, Robert E.  
1978. Prescribed burning: decisions, prescriptions, strategies. Preprints, 5th national conference on fire and forest meteorology, p. 94-99, illus. Am. Meteorol. Soc. (PNW)
- Mobley, Hugh E., Robert S. Jackson, William E. Balmer, and others.  
1977. A guide for prescribed fire in southern forests. 40 p. (Rev.) (SE)
- Murphy, James L.  
1977. New Forest Service prevention research project helps in California wildfire emergency. Fire Manage. Notes 38(1):9. (PSW)
- Murphy, James L., and Eugene Murphy.  
1977. Preventing firework fires on the San Bernardino National Forest during the Bicentennial July 4th Holiday. Fire Manage. Notes 38(3):14-16. (PSW)
- McNab, W. Henry, and Edward E. Ach.  
1977. Slash burning increases survival and growth of planted loblolly pine in the Piedmont. Tree Planters' Notes 28(2):22-24. (SE)
- Nord, Eamor C., and Lisle R. Green.  
1977. Low-volume and slow-burning vegetation for planting clearings in California chaparral. U.S. Dep. Agric. For. Serv. Res. Pap. PSW-124. 41 p. illus. (PSW)
- Norum, Rodney A.  
1977. Preliminary guidelines for prescribed burning under standing timber in western larch/Douglas-fir forests. U.S. Dep. Agric. For. Serv. Res. Note INT-229. 15 p. (INT)
- Philpot, Charles W.  
1977. Vegetation features as determinants of fire frequency and intensity. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. WO-3, p. 12-16. (PSW)
- Radtke, Klaus.  
1977. Wildland plantings native and exotic, 1911-1977. Los Angeles Dep. of For. and Fire Warden, For. Div. p. 1-135. (PSW)
- Rousopoulos, Peter J.  
1978. A decision aid for wilderness fire prescriptions on the Boundary Waters Canoe Area. *In* Preprint 5th national conference on fire and forest meteorology proceedings, p. 52-58. Am. Meteorol. Soc. (NC)
- Ryan, Frank L., Frank H. Gladen, and William S. Folkman.  
1978. Team teaching fire prevention program: evaluation of an educational technique. U.S. Dep. Agric. For. Serv. Res. Pap. PSW-129, 6 p. (PSW)
- Ryan, Kevin C., and Stewart G. Pickford.  
1978. Physical properties of woody fuels in the Blue Mountains of Oregon and Washington. U.S. Dep. Agric. For. Serv. Res. Note PNW-315. 10 p. (PNW)

## INSECTS AND DISEASES

### Diseases

### Air Pollution

- Anderson, Robert L., and Leon S. Dochinger.  
1978. How to identify white pine susceptible to air pollution. 4 p. (Unnumbered publ.) (NE)
- Bringi, Sreedevi Krishnamurthy.  
1978. Methodology of forest-tree selection for air pollution studies. Ohio State Univ. Rep. AS-S-102 (EE5-511x-2). 85 p. (NE)
- Cowling, Ellis B., and Leon S. Dochinger.  
1978. The changing chemistry of precipitation and its effects on vegetation.

- tation and materials. Am. Inst. Chem. Eng. Symp. Ser. 74:134-142. (NE)
- Dochinger, Leon S., and Stanford L. Arner.  
1978. Needle mottle in eastern white pine seedlings: a selective parameter for air pollution sensitivity. U.S. Dep. Agric. For. Serv. Res. Pap. NE-406. 5 p. (NE)
- Dochinger, Leon S., and Jack G. Calvert.  
1978. Air pollution sources: general effects and trends. In New directions in Century 3, strategies for land and water use. Proc. Soil Conserv. Soc. Am. 33:187-193. (NE)
- Dochinger, Leon S., and Ellis B. Cowling.  
1978. Impact of acid precipitation on forest and freshwater ecosystems in Norway. J. Water, Air, and Soil Pollut. 8:389-390. (NE)
- Glass, Norman R., Gene Likens, and Leon Dochinger.  
1978. The ecological effects of atmospheric deposition. (Abstr.) 3d Natl. Conf. Interagency Energy/Environ. R&D Program: 7 (NE)
- Jensen, Keith F.  
1977. Sulfur dioxide affects growth of forest tree species. (Abstr.) In Proc. Am. Phytopathol. Soc. 4:89 (NE)
- Krause, C. R., and K. F. Jensen.  
1978. Microtopographical changes in hybrid poplar leaves associated with air pollution exposure. Scanning Electron Microscopy 2:738, 755-757. (NE)
- Nielsen, D. G., L. E. Terrell, T. C. Weidensaul.  
1977. Phytotoxicity of ozone and sulfur dioxide to laboratory fumigated Scotch pine. Plant Dis. Rep. 61:699-703. (NE)
- Seliga, Thomas A.  
1978. Summary of the first international symposium and workshop on acid precipitation and the forest ecosystem. Ohio State Univ. Rep. AS-S-101. 39 p. (NE)
- Biology and Behavior**
- Anderson, N. A., M. E. Ostry, and G. W. Anderson.  
1977. Infection of aspen by *Hypoxylon mammatum* through galls formed by *Saperda inornata*. (Abstr. 133) In Proc. Am. Phytopathol. Soc. 4:110-111. (NC)
- Barrows, J. B., and L. D. Dwinell.  
1978. Decay of *gladiolus* corms caused by the pine pitch canker fungus *Fusarium moniliforme* var. *subglutinans*. (Abstr. Phytopathol. News 12(9). (SE)
- Bega, Robert V.  
1978. Phomopsis lokoyae outbreak in a California forest nursery. Plant Dis. Rep. 62:567-569. (PSW)
- Bega, Robert V., R. S. Smith, Jr., A. P. Martinez, and C. J. Davis.  
1978. Severe damage to *Pinus radiata* and *P. pinaster* by *Diplodia pinea* and *Lophodermium* spp. on Molokai and Lanai in Hawaii. Plant Dis. Rep. 62(4):329-331. (PSW)
- Black, W. M., and Dan Neely.  
1978. Relative resistance of *Juglans* species and hybrids to walnut anthracnose. Plant Dis. Rep. 62:497-499. (NC)
- Black, W. M., and Dan Neely.  
1978. Effects of temperature, free moisture, and relative humidity on the occurrence of walnut anthracnose. Phytopathology 68:1054-1056. (NC)
- Black, W. M., and Dan Neely.  
1977. Effects of selected environmental factors on the severity of walnut anthracnose. In Proc. Am. Phytopathol. Soc. 3(1976):284. (NC)
- Burdsall, H. H., Jr., O. K. Miller, Jr., and K. A. Nishijima.  
1978. Morphological and mating system studies of a new taxon of *Hericium*(Aphyllophorales, Hericiaceae) from the southern Appalachians. Mycotaxon 7(1):1-9. (FPL)
- Calvin, Clyde L., F. G. Hawksworth, and D. Knutson.  
1978. Phloem in *Arceuthobium*. (Abstr.) Bot. Soc. Am. Misc. Publ. 156:25. (RM)
- Crawford, Daniel J., and Frank G. Hawksworth.  
1978. Flavonoids of the genus *Arceuthobium* (Viscaceae). (Abstr.) Bot. Soc. Am. Misc. Publ. 156:8. (RM)
- Dixon, Gary E.  
1978. A spread of intensification model for mistletoe in ponderosa pine. Diss. Abstr. 38(7):2963-B. (RM)
- Dorworth, C. E., J. Krywienczyk, and D. D. Skilling.  
1977. New York isolates of *Gremmeniella abietina* (*Scleroderma lagerbergii*) identical in immunogenic reaction to European isolates. Plant Dis. Rep. 61(10):887-890. (NC)
- Dwinell, L. D.  
1978. Susceptibility of southern pines to infection by *Fusarium moniliforme* var. *subglutinans*. Plant Dis. Rep. 62(2):108-111. (SE)



- Dwinell, L. D.  
1977. Biology of fusiform rust. *In* Management of fusiform rust in southern pines, p. 13-24. Symp. Proc. Univ. Fla. (SE)  
Dwinell, L. D., and J. B. Barrows.  
1978. Recovery of the pine pitch canker fungus from pine plantation and seed orchard soil. (Abstr.) Phytopathol. News 12(9). (SE)  
Dwinell, L. D., and P. E. Nelson.  
1978. Susceptibility of slash and loblolly pines to strains of *Fusarium moniliforme* and its variety *subglutinans*. (Abstr.) Phytopathol. News 12(9). (SE)  
Dwinell, L. D., P. L. Ryan, and E. G. Kuhlman.  
1977. Pitch canker of loblolly pine in seed orchards. *In* Proc. South. For. Tree Improv. Conf. 14:130-137. (SE)  
Griggs, Margene M., and Ronald J. Dinus.  
1977. Patterns of fusiform rust increase and their implications for selection and breeding. *In* Proc. South. For. Tree Improv. Conf. 14:43-52. (SO)  
Griggs, Margene M., and Robert A. Schmidt.  
1977. Increase and spread of fusiform rust. *In* Management of fusiform rust in southern pines proceedings, p. 32-38. Univ. Fla. (SO)  
Ho, Iwan, and Bratislav Zak.  
1977. Production of growth regulators by *Armillaria ponderosa* Peck. (Abstr.) p. 290. 2d Int. Mycol. Congr. (PNW)  
Hoff, R. J., and G. I. McDonald.  
1978. Genetic variation in susceptibility of western white pine to needle blight. U.S. Dep. Agric. For. Serv. Note INT-244, 8 p. (INT)  
Kais, Albert G.  
1978. Pruning of longleaf pine seedlings in nurseries promotes brown-spot needle blight. Tree Planters' Notes 29(1):3-4. (SO)  
Kessler, K. J., Jr.  
1978. Gnomonia canker, shoot blight, and leaf spot of yellow birch. U.S. Dep. Agric. For. Serv. Res. Pap. NC-152, 12 p. (NC)  
Kliejunas, J. T., R. P. Papp, and R. Smith, Jr.  
1978. Relationships between *Phytophthora cinnamomi*, *Platymyces bilineatus*, and ohia decline on the island of Hawaii. (Abstr.) *In* Proc. Am. Phytopathol. Soc. 4:99. (PSW)  
Kuhlman, E. G.  
1978. Postinoculation temperature and photoperiods: their effects on development of fusiform rust on loblolly pine. Plant Dis. Rep. 62:8-11. (SE)
- Kuhlman, E. G., F. R. Matthews, and H. P. Tillerson.  
1978. Efficacy of *Dartluca filum* for biological control of *Cronartium fusiforme* and *C. strobilinum*. Phytopathology 68:507-511. (SE)  
Kuntz, J., A. Prey, B. Ambuel, and E. Sarkis.  
1978. The etiology and epidemiology of butternut canker. Proc. Am. Phytopathol. Soc. 4(1977):84. (NC)  
Lewis, Robert, Jr., and Eugene P. Van Arsdel.  
1978. Development of Botryodiplodia cankers in sycamore at controlled temperatures. Plant Dis. Rep. 62:125-126. (SO)  
Lewis, Robert, Jr., and Eugene P. Van Arsdel.  
1978. Canker production by strains of *Botryodiplodia theobromae* in Cephalosporium-wilted sycamore. U.S. Dep. Agric. For. Serv. Res. Note SO-236, 2 p. (SO)  
Lewis, Robert, Jr., and Eugene P. Van Arsdel.  
1978. Vulnerability of water-stressed sycamores to strains of *Botryodiplodia theobromae*. Plant Dis. Rep. 62:62-63. (SO)  
Mathiasen, Robert.  
1978. Seed germination and infection techniques for three southern dwarf mistletoes. Plant Dis. Rep. 62:64-67. (RM)  
Matteoni, James A., and Dan Neely.  
1978. Infection frequency and severity of walnut anthracnose with artificial inoculation. *In* Proc. Am. Phytopathol. Soc. 4(1977):166. (NC)  
Matthews, F. R., T. Miller, and L. D. Dwinell.  
1978. Inoculum density: its effects on infection of *Cronartium fusiforme* on seedlings of slash and loblolly pine. Plant Dis. Rep. 62(2):105-108. (SE)  
McCracken, Francis I.  
1978. Fungi associated with diseased sycamores in the South. J. Miss. Acad. Sci. 23 (suppl.):4. (SO)  
McCracken, Francis I., and Erdman C. Burkhardt.  
1977. Destruction of sycamore by canker stain in the Midsouth. Plant Dis. Rep. 61:984-986. (SO)  
Nicholls, T. H., M. E. Ostry, and A. J. Prey.  
1977. *Diplodia pinea* pathogenic to *Pinus resinosa*. (Abstr. 129) *In* Proc. Am. Phytopathol. Soc. 4:110. (NC)  
Ostry, M. E., and T. H. Nicholls.  
1977. Animal vectors of eastern dwarf mistletoe of black spruce. (Abstr. 130) *In* Proc. Am. Phytopathol. Soc. 4:110. (NC)

- Palmer, J. G., I. B. Sachs, and P. Semeniuk.  
1978. The leafspot caused by *Marssonina rosae* observed in scanning electron and light microscopy. Scanning Electron Microscopy, Vol. 11:1019-1026. (FPL)
- Pawuk, William H.  
1978. Damping-off of container-grown longleaf pine seedlings by seed-borne fusaria. Plant Dis. Rep. 62:82-84. (SO)
- Peterson, Glenn W., and Ralph A. Read.  
1977. Epidemiology of western gall rust in ponderosa pine provenance plantings in southcentral Nebraska. (Abstr.) In Proc. Am. Phytopathol. Soc. 4:110. (RM)
- Phelps, William R., and Felix J. Czabator.  
1978. Fusiform rust of southern pines. U.S. Dep. Agric. For. Serv. Insect and Dis. Leaflet 26, 7 p. (SO)
- Pottle, H. W., A. L. Shigo, and R. O. Blanchard.  
1977. Biological control of wound hymenomycetes by *Trichoderma harzianum*. Plant Dis. Rep. 8:687-690. (NE)
- Powers, H. R., Jr., and O. Gordon Langdon.  
1977. Pond pine clones vary in resistance to *Cronartium fusiforme*. Plant Dis. Rep. 61(11):916-918. (SE)
- Powers, H. R., Jr., F. R. Matthews, and L. D. Dwinell.  
1978. The potential for increased virulence of *Cronartium fusiforme* on resistant loblolly pine. Phytopathology 68(5):808-810. (SE)
- Powers, H. R., Jr., F. R. Matthews, and L. D. Dwinell.  
1977. Evaluation of pathogenic variability of *Cronartium fusiforme* on loblolly pine in the Southern USA. Phytopathology 67(11):1403-1407. (SE)
- Riffle, Jerry W.  
1978. Development of cankers on *Ulmus pumila* related to month of inoculation with *Botryodiplodia hypodermia*. Phytopathology 68:1115-1119. (RM)
- Rowan, S. J.  
1977. Fertilization and inoculum density affect susceptibility to fusiform rust and gall development in slash and loblolly pine seedlings. Plant Dis. Rep. 61(7):609-612. (SE)
- Rowan, S. J.  
1977. Fertilizer-induced changes in susceptibility to fusiform rust among families of slash and loblolly pine. Phytopathology 67(10):1280-1284. (SE)
- Rowan, S. J.  
1978. Susceptibility to fusiform rust in slash pine seedlings depends upon fertilization and cumulative inoculum density in multiple inoculation. U.S. Dep. Agric. For. Serv. Res. Note SE-254, 5 p. (SE)
- Scharpf, Robert F.  
1978. Control of dwarf mistletoe on true firs in the West. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PSW-31, p. 117-123. (PSW)
- Scharpf, Robert F.  
1977. Dwarf mistletoe does not increase trunk taper in released red firs in California. U.S. Dep. Agric. For. Serv. Res. Note PSW-326, 3 p. (PSW)
- Schipper, A. L., Jr.  
1978. A *Hypoxylon mammatum* pathotoxin responsible for canker formation in quaking aspen. Phytopathology 68(6):866-872.
- Schipper, A. L., Jr., H. S. McNabb, and W. F. Haywood.  
1977. Dothichiza and Phomopsis cankers of hybrid poplar in Iowa. (Abstr. 128) In Proc. Am. Phytopathol. Soc. 4:109-110. (NC)
- Shigo, A. L.  
1977. Phialophora melinii: inoculations in wounded red maple. Phytopathology 67:1333-1337. (NE)
- Skilling, D. D.  
1978. Tree diseases — Scleroderris canker — a threat to pines. McGraw-Hill Yearb. Sci. Tech., p. 367-369. (NC)
- Skilling, D. D.  
1977. The development of a more virulent strain of *Scleroderris lagerbergii* in New York State. Eur. J. For. Pathol. 7(5):297-302. (NC)
- Skilling, D. D.  
1977. Spore dispersal and field infection of conifers by *Scleroderris* canker in New York. (Abstr. 131) In Proc. Am. Phytopathol. Soc. 4:110. (NC)
- Skilling, D. D.  
1977. An overview of recent needlecast problems in the Lake States region. (Abstr.) 2d Int. Mycol. Congr. 2:620. (NC)
- Skilling, D. D.  
1977. A new more virulent strain of *Scleroderris* canker in New York. In Proc. Annu. Meet. Eastern Plant Board. 52:104-105. (NC)
- Skilling, D. D.  
1978. A more virulent strain of *Scleroderris* canker in North America. (Abstr. 053) p. 129. In Proc. 3d Int. Congr. Plant Pathol. (NC)

Skilling, D. D., F. S. Schneider, and J. A. Sullivan.

1977. Scleroderma canker on Austrian and ponderosa pine in New York. Plant Dis. Rep. 61(8):707-708. (NC)

Smyly, Walter B., and Theodore H. Filer, Jr.

1977. *Cylindrocylindrium scoparium* associated with root rot and mortality of cherrybark oak seedlings. Plant Dis. Rep. 61:577-579. (SO)

Snow, Glenn A., Ronald J. Dinus, Harry R. Powers, and Frederick R. Mathews.

1977. Influence of pathogenic variability and inoculum density of fusiform rust. In Management of fusiform rust in southern pines proceedings, p. 71-79. Univ. Fla. (SO)

Sterne, R. E., M. R. Kaufmann, and G. A. Zentmyer.

1978. Effects of Phytophthora root rot on water relations of avocado; interpretation with a water transport model. Phytopathology 78: 595-602. (RM)

Sterne, R. E., G. A. Zentmyer, and M. R. Kaufmann.

1977. The influence of matrix potential, soil texture and soil amendment on root disease caused by *Phytophthora cinnamomi*. Phytopathology 67:1495-1500. (RM)

Wargo, Philip M.

1977. *Armillariella mellea* and *Agrius bilineatus* and mortality of defoliated oak trees. For. Sci. 23:485-492. (NE)

Wells, Osborn O., and Ronald J. Dinus.

1978. Early infection as a predictor of mortality associated with fusiform rust of southern pines. J. For. 76:8-12. (SO)

Wicker, Ed F., T. H. Laurent, and Spencer Israelson.

1978. Sirococcus shoot blight damage to western hemlock regeneration at Thomas Bay, Alaska. U.S. Dep. Agric. For. Serv. Res. Pap. INT-198, 11 p. (INT)

Widin, K. D., and A. L. Schipper, Jr.

1977. Development of the uredium of *Melampsora medusae*. (Abstr. 127). In Proc. Am. Phytopathol. Soc. 4:109. (NC)

Widin, K. D., and A. L. Schipper, Jr.

1978. *Melampsora medusae* affects hybrid poplar growth in the north-central USA. (Abstr. 055) p. 130. In Proc. 3d Int. Congr. Plant Pathol. (NC)

## Biology and Suppression of Wood-Decaying Organisms

Aho, Paul E.

1977. Decay of grand fir in the Blue Mountains of Oregon and Washington. U.S. Dep. Agric. For. Serv. Res. Pap. PNW-229, 18 p., illus. (PNW)

Aho, Paul E.

1977. Insect and disease management—a reality? Stem decay solutions. In Time for assessment—harmonizing solutions. Proc. 1977 West. For. Conf., p. 73. West. For. and Conserv. Assoc., Portland, Oreg. (PNW)

Amburgey, Terry L.

1978. How to build decay-resistant fences. (Unnumbered publ.) (SO)

Amburgey, Terry L.

1978. How to make porches live longer. (Unnumbered publ.) (SO)

Amburgey, Terry L.

1978. How to prevent decay in wood decks. (Unnumbered publ.) (SO)

Amburgey, Terry L.

1978. Your roof can be a decay hazard. (Unnumbered publ.) (SO)

Berry, Frederick H.

1977. Decay in yellow poplar, maple, black gum and ash in the central hardwood region. U.S. Dep. Agric. For. Serv. Res. Note NE-242, 4 p. (NE)

Felix, Robert, and A. L. Shigo.

1977. Rots and rods. J. Arboric. 3:187-190. (NE)

Highley, Terry L.

1978. Degradation of cellulose by culture filtrates of *Poria placenta*. Mat. und Organismen 12:161-174. (FPL)

Highley, T. L., and T. C. Scheffer.

1978. Controlling decay in above-water parts of waterfront structures. For. Prod. J. 28(2):40-43. (FPL)

McCracken, Francis I.

1978. Spore release of some decay fungi of southern hardwoods. Can. J. Bot. 56:426-431. (SO)

Scheffer, Theodore C., and Wallace E. Esllyn.

1978. Residual pentachlorophenol still limits decay in woodwork 22 years after dip-treating. For. Prod. J. 28(1):25-30. (FPL)

Shigo, A. L., W. C. Shortle, and P. W. Garrett.

1977. Genetic control suggested in compartmentalization of discolored wood associated with tree wounds. For. Sci. 23:179-182. (NE)

- Shortle, W. C.  
1977. Compartmentalization of decay in red maple and hybrid poplar trees. *In* Proc. of APS Vol 4, p. 86. (NE)
- Shortle, W. C.  
1977. Decay in trees: evaluating the hazard tree. Park Maintenance, May 17-18. (NE)
- Shortle, W. C., and E. B. Cowling.  
1978. Development of discoloration, decay, and microorganisms following wounding of sweetgum and yellow-poplar trees. *Phytopathology* 68:609-616. (NE)
- Shortle, W. C., and E. B. Cowling.  
1978. Interaction of live sapwood and fungi commonly found in discolored and decayed wood. *Phytopathology* 68:617-623. (NE)
- Walters, Russell, and A. L. Shigo.  
1978. Discolouration and decay associated with paraformaldehyde treated tapholes in sugar maple. *Can. J. For. Res.* 8:54-60. (NE)
- ## Detection, Prediction, and Evaluation
- Abrahamson, L. P., S. B. Silverborg, and D. D. Skilling.  
1978. Japanese black pine, *Pinus thunbergii*, a new host for *Scleroderma* canker in North America. *AFRI Res. Note* 26, 2 p. *Applied For. Inst.*, Syracuse, N. Y. (NC)
- Anderson, R. L., and A. L. Schipper, Jr.  
1978. A system for predicting the amount of *Phellinus (Fomes) igniarius* rot in trembling aspen stands. U.S. Dep. Agric. *For. Serv. Res. Note* NC-232. 4 p. (NC)
- Filer, Theodore H., Jr., James D. Solomon, Francis I. McCracken, and others.  
1977. Sycamore pests: a guide to major insects, diseases, and air pollution. 36 p. (Unnumbered publ.) (SO)
- Froelich, Ronald C.  
1978. How serious is *Fomes annosus*? *For. Farmer* 37(3):6-8. (SO)
- Gottfried, Gerald J., and Robert S. Embry.  
1977. Distribution of Douglas-fir and ponderosa pine dwarf mistletoes in a virgin Arizona mixed conifer stand. U.S. Dep. Agric. *For. Serv. Res. Pap.* RM-192, 16 p. (RM)
- Hawksworth, Frank G.  
1977. The 6-class dwarf mistletoe rating system. U.S. Dep. Agric. *For. Serv. Gen. Tech. Rep.* RM-48, 7 p. (RM)
- Hawksworth, Frank G., and John M. Staley.  
1978. *Rhizosphaera kalkhoffii* on spruce brooms. *Plant Dis. Rep.* 62:446. (RM)
- Hawksworth, Frank G., and Delbert Wiens.  
1977. *Arceuthobium* (Viscaceae) in Mexico and Guatemala: additions and range extensions. *Brittonia* 29(4):411-418. (RM)
- Hinds, Thomas E., and Eugene M. Wengert.  
1977. Growth and decay losses in Colorado aspen. U.S. Dep. Agric. *For. Serv. Res. Pap.* RM-193, 10 p. (RM)
- Hungerford, Roger D.  
1977. Natural inactivation of blister rust cankers on western white pine. *For. Sci.* 23:343-350. (INT)
- Johnson, David W., and Frank G. Hawksworth.  
1977. Shoestring root rot in a lodgepole pine stand, Poudre Ranger District, Arapaho and Roosevelt National Forest. *Biol. Eval.* R2-77-22. 4 p. (RM)
- Johnson, David W., and Thomas E. Hinds.  
1977. Aspen mortality at the Maroon Lake campground, Aspen Ranger District, White River National Forest. *Biol. Eval.* R2-77-21. 18 p. (RM)
- Nicholls, T. H., and R. L. Anderson.  
1977. How to identify white pine blister rust and remove cankers. U.S. Dep. Agric. *For. Serv. Leaflet*, 8 p. (NC)
- Ostry, M. E., and T. H. Nicholls.  
1978. How to identify and control noninfectious diseases of trees. U.S. Dep. Agric. *For. Serv. Leaflet*, 16 p. (NC)
- Shigo, A. L., W. C. Shortle, and J. Ochrymowych.  
1977. Detection of active decay at groundline in utility poles. U.S. Dep. Agric. *For. Serv. Tech. Rep.* NE-35, 26 p., illus. (NE)
- Thies, Walter G., Kenelm W. Russell, and Larry C. Weir.  
1977. Distribution and damage appraisal of *Rhizina undulata* in western Oregon and Washington. *Plant Dis. Rep.* 61(10):859-862. (PNW)
- Williams, R. E., and C. D. Leaphart.  
1978. A system using aerial photography to estimate area of rooted disease centers in forests. *Can. J. For. Res.* 8(2):214-219. (INT)

## General

- Amburgey, Terry L.  
1977. Fungitoxicity of pentachlorophenol having reduced impurities. *For. Prod. J.* 27(11):18-19. (SO)
- Amburgey, Terry L.  
1978. Home insulation and the pest control operator. *Pest Control* 46(7):18-20. (SO)
- Amburgey, Terry L., and Bruce R. Johnson.  
1978. Effect of ammonium hydroxide on thiamine and available micro-nutrients in ponderosa pine sapwood. *Phytopathology* 68:951-954. (SO)
- Berry, C. R.  
1977. Initial response of pine seedlings and weeds to dried sewage sludge in rehabilitation of an eroded forest site. *U.S. Dep. Agric. For. Serv. Res. Note SE-249*. 8 p. (SE)
- Berry, C. R., and D. H. Marx.  
1977. Growth of loblolly pine seedlings in stripmined kaolin spoil as influenced by sewage sludge. *J. Environ. Qual.* 6:379-381. (SE)
- Blanchard, R. O., and W. C. Shortle.  
1977. Changes in electrical resistance associated with disease and death of elm seedlings. *In Proc. APS Vol 4*: 183. (NE)
- Blanchard, R. O., Desmond Smith, A. L. Shigo, and L. O. Safford.  
1978. Effects of soil-applied potassium on cation distribution around wounds in red maple. *Can. J. For. Res.* 8: 228-231. (NE)
- Filer, Theodore H., Jr.  
1978. Effective weed control in nurseries. (Abstr.) *J. Miss. Acad. Sci.* 23 (suppl.):3. (SO)
- Fogel, Robert.  
1976. Notes on distribution and spore ornamentation of *Mycocleus sicigleba* (Basidiomycetes, Cribbeaceae). *Mycologia* 68(5):1097-1103, illus. (PNW)
- Fogel, Robert.  
1977. Additions to the hypogeous mycoflora of Colorado. II. *Sclerotaster xerophilum* (Basidiomycetes, Hymenogastreales). *Mycologia* 69(5):980-986, illus. (PNW)
- Fogel, Robert, and James M. Trappe.  
1978. Fungus consumption (mycophagy) by small animals. *Northwest Sci.* 52(1):1-31, illus. (PNW)
- Forest Service, U.S. Department of Agriculture.  
1978. Dieback of black walnut saplings. *U.S. Dep. Agric. For. Serv. Leaflet*. 1 p. (NC)
- Goddard, Ray E., and Osborn O. Wells.  
1977. Susceptibility of southern pines to fusiform rust, p. 52-58. *In* Management of fusiform rust in southern pines proceedings. Univ. Fla. (SO)
- Hawksworth, F. G., and R. F. Scharpf.  
1978. Literature of the dwarf mistletoes: damage and control. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PSW-31*, p. 180-190. (RM)
- Jensen, Keith F., and Frederick W. Bender.  
1977. Seedling-size fumigation chambers. *U.S. Dep. Agric. For. Serv. Res. Pap. NE-383*. 4 p. (NE)
- Jurgensen, M. F., M. J. Larsen, and A. E. Harvey.  
1978. Effects of timber harvesting on soil biology. *In Proc. Soc. Am. For.* 1977 Natl. Con., p. 244-250. (FPL)
- Kondo, Katsuhiko, Lytton J. Musselman, and William F. Mann, Jr.  
1978. Karyomorphological studies in some parasitic species of the Scrophulariaceae. I. *Brittonia* 30:345-354. (SO)
- Larsen, Michael J., and Robert L. Gilbertson.  
1978. *Laeticorticium lombardiae* (Aphylliphorales, Corticiaceae): a newly recognized segregate from the *L. roseum* complex. *Mycologia* 70(1):206-208. (FPL)
- Li, C. Y.  
1977. Conversion of *p*-coumaric acid to caffeic acid and of *p*-hydroxyphenylacetic acid to 3,4-dihydroxyphenylacetic acid by *Alnus rubra*. *Lloydia* 40(3):298-300. (PNW)
- Li, C. Y.  
1978. Soil fatty acids under alder, conifer, and mixed alder-conifer stands of coastal Oregon. *Soil Sci.* 125(2):92-94. (PNW)
- McGinnis, E. A., J. E. Phelps, P. S. Szopa, and A. L. Shigo.  
1977. Wood anatomy after tree injury—a pictorial study. *Res. Bull.* 1025. Univ. Mo. at Columbia. 35 p. (NE)
- Musselman, Lytton J., and William F. Mann, Jr.  
1977. Seed germination and seedlings of *Krameria lanceolata* (Krameriacae). *SIDA* 7(2):224-225. (SO)
- Musselman, Lytton J., and William F. Mann, Jr.  
1977. Parasitism and haustorial structure of *Schwalbea americana* (Scrophulariaceae). *Beitr. Biol. Pflanzen* 53:309-315. (SO)



- Musselman, Lytton J., and William F. Mann, Jr.  
1977. Cataphyll behavior in *Ximenia americana* seedlings (Olacaceae). Beitr. Biol. Pflanzen 53:121-125. (SO)
- Paine, Lee A., and James W. Clarke.  
1978. Tree failures and accidents in recreation areas: a guide to data management for hazard control. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PSW-24, p. 30. (PSW)
- Parker, Johnson.  
1977. Phenolics in black oak bark and leaves. J. Chem. Ecol. 3:489-496. (NE)
- Parker, Johnson.  
1978. Effects of fertilization on shoot growth of defoliated and under-foliated red oak seedlings. U. S. Dep. Agric. For. Serv. Res. Pap. NE-399. (NE)
- Parker, Johnson.  
1978. Free sugars and polyols in developing birch leaves. (Abstr.) Plant Physiol. Supplement 61:9. (NE)
- Parmeter, J. R., F. G. Hawksworth, and R. F. Scharpf.  
1978. Needed research and development to improve dwarf mistletoe controls. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PSW-31, p.178-179. (RM)
- Rexrode, Charles O., and Robert E. Frame.  
1977. Root graft incidence at oak wilt sites in West Virginia. Plant Dis. Rep. 61: 970-971. (NE)
- Rowan, S. J.  
1978. Pine bark recommended as potting medium in tests for fusiform rust resistance. U.S. Dep. Agric. For. Serv. Res. Note SE-246. 5 p. (SE)
- Schmidt, R. A., A. E. Squillace, and B. F. Swindel.  
1977. An age-dependent predictive model for fusiform rust incidence in five to ten year old pine plantations. IMPAC Rep. 2(2):10. (SE)
- Shigo, A. L.  
1977. Protecting your beautiful trees. Woman's Day, November. (NE)
- Shigo, A. L.  
1978. Tree decay: time to expand the concept. IUFRO Proc. Kassel, Germany. (NE)
- Shigo, A. L.  
1977. A new look at tree care. Arboric. J. 3:157-164. (NE)
- Shigo, A. L.  
1977. Injection wounds in elm. Natl. Arbor. Assoc., p. 54-56. (NE)
- Shigo, A. L.  
1977. Superior tree production fights tree wound fatalities. Am. Nurseryman 12:10-11. (NE)
- Shigo, A. L.  
1977. When to call the tree doctor. McCall's, April, p. 55. (NE)
- Shigo, A. L., and R. Campana.  
1977. Discolored and decayed wood associated with injection wounds in American elm. J. Arboric. 3:230-235. (NE)
- Shigo, A. L., and R. Campana.  
1977. Discoloration and decay associated with treatment wounds from chemical injection of elms to control Dutch elm disease. In Proc. APS Vol. 4:218-219. (NE)
- Shigo, A. L., Walter Money, and Dale Dodds.  
1977. Some internal effects of Maugey tree injections. J. Arboric. 3: 213-220. (NE)
- Shigo, A. L., Nelson Rogers, E. A. McGinnes, and David T. Funk.  
1978. Black walnut on Kansas strip mine spoils: some observations 25 years after pruning. U.S. Dep. Agric. For. Serv. Res. Pap. NE-393. 14 p. illus. (NE)
- Shortle, W. C.  
1976. Tree care: a new look. In Proc. Midwest. Ch. ISTC: 33-35. (NE)
- Shortle, W. C., A. L. Shigo, P. Berry, and J. Abusamra.  
1977. Electrical resistance in tree cambium zone: relationship to rates of growth and wound closure. For Sci. 23: 326-329. (NE)
- Shortle, W.C., A. L. Shigo, and J. Ochrymowych.  
1978. Patterns of resistance to a pulsed electric current in sound and decayed utility poles. For. Prod. J. 28:48-51. (NE)
- Stewart, E. L., and James M. Trappe.  
1978. *Austrogautieria* gen. nov. (Hypogeous Basidiomycetes) (Abstr.) Mycol. Newsl. 29(1):78. Mycol. Soc. Am. (PNW)
- Trappe, James M.  
1977. Three new Endogonaceae: *Glomus constrictus*, *Sclerocystis clavisporea*, and *Acaulospora scrobiculata*. Mycotaxon 6(2):359-366. (PNW)
- Wells, Osborn O.  
1977. Provenance research and fusiform rust in the Southern United States, p. 23-28. In Proc. 4th North Am. For. Biol. Workshop. (SO)
- Wolter, K. E.  
1978. Ethylene induced synthesis and deposition of oleoresin in systemically treated red pine. Plant Physiol. 61:50. (FPL)

# Mycorrhizae

- Barrows, J. B., and R. W. Roncadori.  
1977. Endomycorrhizal synthesis by *Gigaspora Margarita* in poinsettia. *Mycologia* 69:1173-1184. (SE)
- Berry, C. R., and D. H. Marx.  
1977. Manipulation of selected mycorrhizal fungi to increase forest biomass. Am. Pulpwood Assoc. Tech. Pap. 78-P-3. 1 p. (SE)
- Berry, C. R., and D. H. Marx.  
1978. Effects of *Pisolithus tinctorius* ectomycorrhizae on growth of loblolly and Virginia pines in the Virginia pines in the Tennessee Copper Basin. U.S. Dep. Agric. For. Serv. Res. Note SE-264. 6 p. (SE)
- Daniels, Barbara A.  
1978. Factors affecting germination of endomycorrhizal spores. Ph.D. thesis, Oreg. State Univ., Corvallis. 62 p. (PNW)
- Daniels, Barbara A.  
1977. Spore germination of endomycorrhizal species. (Abstr.) p. 74. 3d North Am. Conf. Mycorrhizae. (PNW)
- Ho, Iwan.  
1977. Phytosterols in root systems of mycorrhizal and nonmycorrhizal *Zea mays* L. *Lloydia* 40(5):476-478. (PNW)
- Ho, Iwan, Bratislav Zak, and James M. Trappe.  
1977. Nitrate reductase activity of mycorrhizal fungi of Douglas-fir. (Abstr.) p. 291. 2d Int. Mycol. Congr. (PNW)
- Larsen, Michael J., and Bratislav Zak.  
1978. *Byssosporia* gen. nov.: taxonomy of the mycorrhizal fungus *Poria terrestris*. Can. J. Bot. 56(9):1122-1129. (PNW)
- Marx, D. H., and J. D. Artman.  
1978. Growth and ectomycorrhizal development of loblolly pine seedlings in nursery soil infested with *Pisolithus tinctorius* and *Thelephora terrestris* in Virginia. U.S. Dep. Agric. For. Serv. Res. Note SE-256. 4 p. (SE)
- Marx, D. H., W. C. Bryan, and C. E. Cordell.  
1977. Survival and growth of pine seedlings with *Pisolithus* ectomycorrhizae after two years on reforestation sites in North Carolina and Florida. For. Sci. 23:363-373. (SE)
- Marx, D. H., W. G. Morris, and J. Mexal.  
1978. Growth and ectomycorrhizal development of loblolly pine seedlings in fumigated and nonfumigated soil infested with different fungal symbionts. For. Sci. 24:193-203. (SE)
- Molina, Randolph J., James M. Trappe, and Gerald S. Strickler.  
1977. Mycorrhizal fungi associated with *Festuca* in the western United States and Canada. (Abstr.) p. 58. 3d North Am. Conf. Mycorrhizae. (PNW)
- Riffe, Jerry W.  
1977. First report of vesicular-arbuscular mycorrhizae on *Elaeagnus angustifolia*. *Mycologia* 69(6):1200-1203. (RM)
- Riffe, Jerry W.  
1977. Mycorrhizal investigations in the Great Plains (Abstr.) p. 37. In 3d North Am. Conf. on Mycorrhizae. (RM)
- Riffe, Jerry W.  
1977. Soil fumigation affects endomycorrhizal development on broad-leaf seedlings in the northern plains nursery. (Abstr.) In Proc. Am. Phytopathol. Soc. 4:119. (RM)
- Riffe, Jerry W.  
1977. Ectomycorrhizal inoculation of seedbeds and container growing media. In Proc. Internat. Nurserymen's Assoc. 1977:73-85. (RM)
- Trappe, James M.  
1977. Biogeography of mypogeous fungi: trees, mammals, and continental drift. (Abstr.) p. 675. 2d Int. Mycol. Congr. (PNW)
- Trappe, James M.  
1977. Small mammals as vectors of hypogeous mycorrhizal fungus spores. (Abstr.) p. 111. 3d North Am. Conf. Mycorrhizae. (PNW)
- Trappe, James M.  
1977. Selection of fungi for ectomycorrhizal inoculation in nurseries. Annu. Rev. Phytopathol. 15:203-222. (PNW)
- Trappe, James M.  
1977. Differential response and field performance of containerized seedlings of Douglas-fir, western hemlock, and ponderosa pine inoculated with different ectomycorrhizal fungi. (Abstr.) p. 43. 3d North Am. Conf. Mycorrhizae. (PNW)
- Trappe, James M., and Robert D. Fogel.  
1977. Ecosystematic functions of mycorrhizae. In the belowground ecosystem: a synthesis of plant-associated processes, p. 205-214. Range Sci. Dep. Sci. Ser. No. 26, Colo. State Univ. (PNW)
- Zak, B., and M. J. Larsen  
1978. Characterization and classification of mycorrhizae of Douglas-fir. III. *Pseudotsuga menziesii* + *Byssosporia* (*Poria*) *terrestris* vars. *iliachinorosa*, *parvii*, and *sublutea*. Can. J. Bot. 56(12):1416-1424, illus. (PNW)

## Pest Management Systems

- Hawksworth, F. G.  
1978. Yield simulations in dwarf mistletoe-infested stands. *In* Proc. 25th Western Int. Work Conf. 1977:101-108. (RM)
- Miller, T.  
1977. Fusiform rust management strategies in concept: site preparation. *In* Management of fusiform rust in southern pines. p. 110-115. Symp. Proc. Univ. Fla. (SE)
- Powers, H. R., Jr., and E. Brender.  
1977. Fusiform rust management strategies in concept: plantation management. *In* Management of fusiform rust in southern pines, p. 122-127. Symp. Proc. Univ. Fla. (SE)
- Roth, Lewis F., Charles G. Shaw III, and Leonard Rolph.  
1977. Marking ponderosa pine to combine commercial thinning and control of *armillaria* root rot. *J. For.* 75(10):644-647. (PNW)
- Rowan, S. J.  
1977. Fusiform rust management strategies in concept: nursery management. *In* Management of fusiform rust in southern pines, p. 116-121. Symp. Proc. Univ. Fla. (SE)
- Wicker, Ed F.  
1978. Refinement and quantification of data for regulating dwarf mistletoe populations: an ecosystems approach, p. 137-142. *In* Proc. Dwarf mistletoe control through For. Manage. Symp. (INT)

## Suppression and Prevention Techniques

- Barger, Jack H., David P. Worley, and William N. Cannon, Jr.  
1977. Effective Dutch elm disease control by early discovery and quick removal. *In* Proc. Annu. Conf. Dutch Elm Dis. 32:6-12, Coop. Ext. Serv., Univ. Mass. (NE)
- Black, W. M., Dan Neely, and James A. Matteoni.  
1977. How to identify and control leaf spot diseases of black walnut. U.S. Dep. Agric. For. Serv. Leaflet. 5 p. (NC)
- Cannon, William N., Jr., Jack H. Barger, and David P. Worley.  
1977. Intensive sanitation program shows cost savings of 25% in Dutch elm disease control. *Park Maintenance* 30(12):10-13. (NE)

- Cooper, Donald T., Theodore H. Filer, Jr., and Osborn O. Wells.  
1977. Geographic variation in disease susceptibility of American sycamore. *South. J. Appl. For.* 1(4):21-24. (SO)
- Filer, Theodore H., Jr., and William K. Randall.  
1978. Resistance of twenty-one sweetgum families to *Botryosphaeria ribis*. *Plant Dis. Rep.* 62(1):38-39. (SO)
- Froelich, Ronald C., Charles S. Hodges, Jr., and Steve S. Sackett.  
1978. Prescribed burning reduces severity of annosus root rot in the South. *For. Sci.* 24:93-100. (SO)
- Gregory, Garold F.  
1977. Perspectives in DED control: 1977. *In* The current state of the art of dutch elm disease control, p. 32-35. Nat. Arborists Assoc. Symp. No. 1. (NE)
- Hawksworth, F. G.  
1978. Intermediate cuttings in mistletoe-infested lodgepole pine and southwestern ponderosa pine stands. U.S. Dep. For. Serv. Gen. Tech. Rep. PSW-31, p. 86-92. (RM)
- Hawksworth, F. G.  
1978. Biological factors of dwarf mistletoe in relation to control. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PSW-31, p. 5-15. (RM)
- Kessler, K. J., Jr.  
1978. How to control sapstreak disease of sugar maple. U.S. Dep. Agric. For. Serv. Leaflet. 6 p. (NC)
- McCracken, Francis I.  
1978. Canker diseases of southern hardwoods and their control, p. 101-106. *In* Proc. 2d Symp. Southeast. Hardwoods. (SO)
- Mexal, John G., and Glenn A. Snow.  
1978. Seed treatment with systemic fungicides for the control of fusiform rust in loblolly pine. U.S. Dep. Agric. For. Serv. Res. Note SO-238. 4 p. (SO)
- Peterson, Glenn W.  
1978. Effective and economical methods for controlling diploдия tip blight. *Am. Nurseryman* 147(1):13, 66, 70, 72. (RM)
- Rexrode, Charles O.  
1977. Cacodylic acid reduces the spread of oak wilt. *Plant Dis. Rep.* 61:972-975. (NE)
- Schipper, A. L., Jr., and R. L. Anderson.  
1978. How to identify and minimize white trunk rot of aspen. U.S. Dep. Agric. For. Serv. Leaflet. 4 p. (NC)

## Insects

### Biology, Physiology, and Behavior

- Amman, Gene D.  
1977. The role of mountain pine beetle in lodgepole pine ecosystems: impact on succession. *In* Life sciences proceedings: the role of arthropods in forest ecosystems. p. 3-18. Springer-Verlag, N.Y. (INT)
- Belanger, R. P., G. E. Hatchell, and G. E. Moore.  
1977. Soil and stand characteristics related to southern pine beetle infestations: a progress report for Georgia and North Carolina. *In* Southern forest soils workshop proceedings. South. For. Soils Counc. 6:99-107. (SE)
- Birch, M. C., P. E. Tilden, D. L. Wood, and others.  
1977. Biological activity of compounds isolated from air condensates and frass of the bark beetle, *Ips confusus*. *J. Insect Physiol.* 23: 1373-1376. (PSW)
- Brand, John M., and Stanley J. Barras.  
1977. The major volatile constituents of a Basidiomycete associated with the southern pine beetle. *Lloydia*(CINCI)40:398-400. (SO)
- Campbell, Robert W.  
1978. Some effects of gypsy moth density on rate of development, pupation time and fecundity. *Ann., Entomol. Soc. Am.* 71(3):442-448. (NE)
- Cuthbert, Roy A., and John W. Peacock.  
1978. Response of the elm bark beetle, *Scolytus multistriatus* (Coleoptera: Scolytidae), to component mixtures and doses of the pheromone, Multilure. *J. Chem. Ecol.* 4:363-373. (NE)
- Daley, R. C., C. J. Kislow, and U. E. Brady.  
1978. Comparison of the levels of sex pheromone extracted from female *Carda cautella* (Walker) by three methods. *J. Ga. Entomol. Soc.* 13(2):161-163. (SE)
- Dix, M. E., A. D. Tagestad, D. G. Nelsen, and F. F. Purington.  
1978. Biology and control of lilac borer *Podossia Syringae* (Harris) in the northern Great Plains. U.S. Dep. Agric. For. Serv. Res. Note RM-358, 4 p. (RM)
- Dix, M. E., and R. T. Franklin.  
1978. Field biology of three hymenopterous parasitoids of the southern pine beetle. *J. Ga. Entomol. Soc.* 13(1):71-80. (RM)
- Donley, David E.  
1978. Oviposition by the red oak borer, *Enaphalodes rufulus*. *Ann. Entomol. Soc. of Am.* 71:496-498. (NE)
- Drooz, A. T.  
1977. Notes on *Telenomus* n. sp., an egg parasite of the elm spanworm. *J. Elisha Mitchell Sci. Soc.* 92(2):89-90. (SE)
- Godwin, Paul A., and Thomas M. O'Dell.  
1977. Alternate hosts of *Blepharipa pratensis* (Meigen). U.S. Dep. Agric. For. Serv. Res. Note NE-245. (NE)
- Gore, W. E., G. T. Pearce, G. N. Lanier, and others.  
1977. Aggregation attractant of the European elm bark beetle, *Scolytus multistriatus*. Production of individual components and related aggregation behavior. *J. Chem. Ecol.* 3:429-446. (NE)
- Hoff, R. J., and G. I. McDonald.  
1977. Differential susceptibility of 19 white pine species to woolly aphid (*Pineus coloradensis*). U.S. Dep. Agric. For. Serv. Res. Note INT-225. 6 p. (INT)
- Hoy, Marjorie A.  
1978. Selection for a nondiapausing gypsy moth: some biological attributes of a new laboratory strain. *Ann. Entomol. Soc. Am.* 71(1):75-80. (NE)
- Hoy, Marjorie A.  
1978. Variability of diapause attributes of insects and mites: some evolutionary and practical implications. *In* Proc. Life Sci., Evol. Insect Migr. and Diapause. p. 101-126. (NE)
- Hoy, Marjorie A., and Nancy F. Knop.  
1978. Development, hatch dates, overwintering success, and spring emergence of a "nondiapausing" gypsy moth strain (Lepidoptera: Orgyidae) in field cages. *Can. Entomol.* 110. (NE)
- Kinn, Donald N.  
1978. Diel emergence patterns of the southern pine beetle (*Dendroctonus frontalis* Zimm.). *J. Ga. Entomol. Soc.* 13(1):80-85. (SO)
- Kinn, Donald N., and Jeffrey J. Witcosky.  
1978. Variation in southern pine beetle attack height associated with phoretic uropodid mites. *Can. Entomol.* 110:249-251. (SO)
- Kinn, Donald N., and Jeffrey J. Witcosky.  
1977. Studies on the life cycle and behavior of *Macrocheles boudreauxi* Krantz. *Entomol.* 84:136-144. (SO)
- Kopp, Dennis D., Richard D. Frye, and Arden D. Tagestad.  
1978. Cankermite life cycle and control in shelterbelts. N. Dak. Coop. Ext. Serv. Circ. E-629. 4 p. (RM)

- Lanier, Gerald, N., and Brian W. Burns.  
1978. Barometric flux. Effects on the responsiveness of bark beetles to aggregation attractants. *J. Chem. Ecol.* 4:139-147. (NE)
- Massey, C. L., D. D. Lucht, and J. M. Schmid.  
1977. Roundheaded pine beetle. U.S. Dep. Agric. For. Serv. For. Insect Dis. Leaf. 155. 8 p. (RM)
- Matlack, Martin C., and Daniel T. Jennings.  
1977. Cohabitation of female spiders guarding egg sacs. *J. Kans. Entomol. Soc.* 50:519-522. (NE)
- Mattson, W. J., ed.  
1977. The role of arthropods in forest ecosystems. 104 p. Springer-Verlag. New York: N.Y. (NC)
- Mattson, W. J., and G. W. Erickson.  
1978. Degree-day summation and hatching of the forest tent caterpillar, *Malacosoma disstria* (Lepidoptera: Lasiocampidae). *Great Lakes Entomol.* 11:59-62. (NC)
- Medley, Richard D., and V. M. Carolin, Jr.  
1977. *Chaetophleps nasellensis*, a dipterous parasitoid of the western hemlock looper (Lepidoptera: Geometridae). *Can. Entomol.* 109:1121-1128. (PNW)
- Mitchell, R. G., and J. K. Maksymov.  
1977. Observations of predation on spruce gall aphids within the gall. *Entomophaga* 22(2):179-186. (PNW)
- Montgomery, Michael E., and Lowell R. Nault.  
1977. Aphid alarm pheromones: dispersion of *Hyadaphis erysimi* and *Myzus persicae*. *Ann. Entomol. Soc. Am.* 70(5):669-672. (NE)
- Montgomery, Michael E., and Lowell R. Nault.  
1977. Comparative response of aphids to the alarm pheromone, (E)-B-farnesene. *Ent. Exp. & Appl.* 22:236-242. (NE)
- Moore, G. E.  
1978. Survival of *Ips* and *Dendroctonus terebrans* in pines treated with paraquat by streak and dowel methods, p. 83-88. *In Proc. Res. Coord. Council.* (SE)
- Mott, R. L., H. A. Thomas, and Gene Namkoong.  
1978. In vitro rearing of southern pine beetle larvae on tissue-cultured loblolly pine callus. *Ann. Entomol. Soc. Am.* 71(4):564-566. (SE)
- Nault, L. R., and M. E. Montgomery.  
1977. Aphid pheromones. *In* Aphids as virus vectors. Ch. 22. Academic Press, Inc., New York. (NE)
- Nishino, C., W. S. Bowers, M. E. Montgomery, and others.  
1977. Alarm pheromone of the spotted alfalfa aphid, *Therioaphis maculata* Buckton (Homoptera: Aphididae). *J. Chem. Ecol.* 3(3):349-357. (NE)
- ODell, Thomas M.  
1978. Periodicity of eclosion and premating behavior of gypsy moth. *Ann. Entomol. Soc. Am.* 71(5). (NE)
- Oliveria, Forrest L.  
1978. Poplar tent maker a serious pest of cottonwood plantations in 1977. (Abstr.) *J. Miss. Acad. Sci.*, 23 (suppl.):2. (SO)
- Sanders, C. J., G. E. Daterman, and T. J. Ennis.  
1977. Sex pheromone responses of *Choristoneura* spp. and their hybrids (Lepidoptera: Tortricidae). *Can. Entomol.* 109:1203-1220. (PNW)
- Schmidt, Fred H.  
1977. Differences in thermal requirements for diapause termination in two western *Choristoneura* spp. (Lepidoptera: Tortricidae). *Can. Entomol.* 109:1469-1474. (PNW)
- Schmidt, Fred H., Robert K. Campbell, and Stephen J. Trotter, Jr.  
1977. Errors in determining instar numbers through head capsule measurements of a Lepidopteran—a laboratory study and critique. *Ann. Entomol. Soc. Am.* 70(5):750-756. (PNW)
- Schmid, J. M., and R. H. Frye.  
1977. Spruce beetle in the Rockies. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-49, 38 p. (RM)
- Solomon, James D.  
1977. Prolonging longevity of short-lived male carpenterworm moths for laboratory investigations. *J. Ga. Entomol. Soc.* 12:327-328. (SO)
- Solomon, James D., and William K. Randall.  
1978. Biology and damage of the willow shoot sawfly in willow and cottonwood. *Ann. Entomol. Soc. Am.* 71:654-657. (SO)
- Stevens, Robert E., Thomas K. Borg, and T. O. Thatcher.  
1977. Notes on a pine-feeding budworm, *Choristoneura lambertiana ponderosana* (Lepidoptera: Tortricidae), in the Colorado Rockies. *Can. Entomol.* 109(9):1269-1274. (RM)
- Stevens, Robert E., and Wayne Brewer.  
1977. Pine tip moths: characteristics and control. Colo. State Univ. Publ. 5.529. (RM)
- Stevens, Robert E., and Daniel T. Jennings.  
1977. Western pine-shoot borer—a threat to intensive management of ponderosa pine in the Rocky Mountain area and Southwest. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-45. 8 p. (RM)



- Stevens, Robert E., J. Wayne Brewer, and Daniel T. Jennings.  
1977. Life history and habits of *Coleotechnites edulicola* (Gelechiidae).  
A pinyon needle miner in the southwest. *Lepidop. Soc.* 32(2):123-129. (RM)
- Surgeoner, Gordon A., and William E. Walner.  
1978. Evidence of prolonged diapause in prepupae of the variable oak leaf caterpillar, *Heterocampa manto*. *Environ. Entomol.* 7(2): 1186-188. (NE)
- Werner, Richard A.  
1977. Diapause termination in overwintering pupae of *Rheumaptera hastata* (Lepidoptera: Geometridae) in interior Alaska. *Can. Entomol.* 109:1149-1152. (PNW)
- Werner, Richard A.  
1978. The spruce beetle in Alaska forests. U.S. Dep. Agric. For. Serv. Inf. Leaflet, illus. (PNW)
- Werner, Richard A., and Bruce H. Baker.  
1977. Spear-marked black moth. U.S. Dep. Agric. For. Serv. For. Insect and Dis. Leaflet 156, 7 p., illus. (PNW)
- Werner, R. A., B. H. Baker, and P. A. Rush.  
1977. The spruce beetle in white spruce forests of Alaska. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PNW-61, 13 p., illus (PNW)
- Wickman, Boyd E.  
1978. Phenology of tussock moth. *In* McGraw-Hill yearbook of science and technology, p. 183-185, illus. McGraw-Hill Book Co., New York. (PNW)
- Wilson, L. F.  
1977. Some reforestation practices that increase insect pest buildup. *In* Insect ecology-papers presented in the A.C. Hudson ecology series, Univ. Minn. Agric. Exp. Stn. Tech. Bull. 310:102-107. (NC)

## Biology and Suppression of Wood-Destroying Insects

- Amburgey, Terry L.  
1978. Porches and planters: they can cause termite and decay damage. (Unnumbered Publ.) (SO)
- Amburgey, Terry L., and Raymond H. Beal.  
1977. White rot inhibits termite attack. *Sociobiology* 3(1):35-38. (SO)
- Amburgey, Terry L., Fairie Lyn Carter, and Donald R. Roberts.  
1978. Resistance of wood from paraquat-treated southern pine trees to termites and the fungus *Gloeophyllum trabeum*. *Wood Sci.* 10(4): 187-192. (SO)

- Amburgey, Terry L., and Richard V. Smythe.  
1977. Shelter tube construction and orientation by *Reticulitermes flavipes* in response to stimuli produced by brown-rotted wood. *Sociobiology* 3(1):27-34. (SO)
- Amburgey, Terry L., and Richard V. Smythe.  
1977. Factors influencing the production of termite trail-following and arrestant stimuli by isolates of *Gloeophyllum trabeum*. *Sociobiology* 3(1):13-26. (SO)
- Amburgey, Terry L., and Richard V. Smythe.  
1977. Factors influencing termite feeding on brown-rotted wood. *Sociobiology* 3(1):1-12. (SO)
- Carter, Fairie Lyn.  
1977. Wood. *In* McGraw-Hill 1977 yearbook of science and technology, p. 423-425. McGraw-Hill Book Co., Inc., New York. (SO)
- Carter, Fairie Lyn, Allison M. Garlo, and James B. Stanley.  
1978. Termiticidal components of wood extracts: 7-Methyljuglone from *Diospyros virginiana* J. Agric. Food. Chem. 26(4):869-873. (SO)
- Howard, Ralph W., Clarence A. McDaniel, and Gary J. Blomquist.  
1978. Cuticular hydrocarbons of the eastern subterranean termite, *Reticulitermes flavipes* (Kollar) (Isoptera: Rhinotermitidae). *J. Chem. Ecol.* 4(2):233-245. (SO)
- Mauldin, Joe K., Nely M. Rich, and David W. Cook.  
1978. Amino acid synthesis from 14C-acetate by normally and abnormally faunated termites, *Coptotermes formosanus*. *Insect. Biochem.* 8:105-109. (SO)
- Moore, Harry B., and Michael I. Haverly.  
1978. Insects injurious to unfinished and finished wood. p. 235-321. *In* For. insect survey and control, a syllabus. (PSW)
- Nutting, W. L., and M. I. Haverly.  
1978. Termite swarming and local weather patterns: a progress report. p. 213-218. *In* Proc. 8th Int. Congr. Union for the Study of Social Insects. (PSW)
- Smith, Virgil K., and Raymond H. Beal.  
1978. The best way to fight termites is before your house is built. (Unnumbered Publ.) (SO)
- Wheeler, J. W., M. S. Blum, H. V. Daly, C. J. Kislw, and J. M. Brand.  
1978. Chemistry of mandibular gland secretions of small carpenter bees (Ceratina spp.). *Ann. Entomol. Soc. Am.* 70(5):635-636. (SE)
- Williams, Lonnie H.  
1978. Homeowners guide to wood-destroying insects. (Unnumbered

Publ.) (SO)

Williams, Lonnie H., and J. David Waldrop.

1978. *Xyletinus peltatus* seasonal flight, diel activity, and associated environmental influences. Ann. Entomol. Soc. Am. 71:567-574. (SO)

## Detection, Prediction, and Evaluation

Beckwith, Roy C., R. R. Mason, and H. G. Paul.

1978. Regression for estimating number of Douglas-fir tussock moth eggs relative to egg mass weight. Can Entomol. 110:131-134, illus. (PNW)

Campbell, Robert W., and Ronald J. Sloan.

1978. Natural maintenance and decline of gypsy moth outbreaks. Environ. Entomol. 7(3):389-395. (NE)

Daterman, G. E., R. L. Livingston, and R. G. Robbins.

1977. How to identify tussock moths caught in pheromone traps. U.S. Dep. Agric., Agric. Handb. 517, 14 p. (PNW)

Daterman, G. E., and L. L. Sower.

1977. Douglas-fir tussock moth pheromone research using controlled-release systems. p. 68-77. In Proc. 1977 Int. Controlled Release Pestic. Symp. (PNW)

Dix, M. E., and G. Howe.

1977. Insect, mite and disease problems of shelterbelts, p. 43. In Proc. Shelterbelt Comm. Meet. Wasagaming, Man., Canada. (RM)

Dix, M. E., A. D. Tagerstad, and M. Jacobson.

1977. Trapping male *Petrova metallica* (Busck) with synthetic attractants. In Proc. North. Cent. Branch Ent. Soc. Am. 32:63. (RM)

Dix, M. E., and J. L. Van Deusen.

1978. Major infestation of *Petrova metallica* Busck in a ponderosa pine provenance planting. In Proc. N.D. Acad. Sci. 70th Annu. Meet. 32:14. (RM)

Dixon, Wayne N., Mark W. Houseweart, and Daniel T. Jennings.

1978. How to examine branches for spruce budworm egg masses. CANUSA/CFRU Publ. 18 p. (NE)

Dixon, W. N., M. W. Houseweart, and Daniel T. Jennings.

1978. How to examine branches for spruce budworm egg masses. Coop. For. Res. Unit, School of For. Res., Univ. Maine at Orono, 16 p. (NE)

Donley, David E., and J. Ronald Terry.

1977. How to identify damage by major oak borers in the Eastern United States. (Unnumbered publ.) (NE)

Ferrell, George G.

1978. Moisture stress threshold of susceptibility to fir engraver beetles in pole size white fir. For. Sci. 24(1):85-92. (PSW)

Galford, Jimmy R.

1978. A trap for tree-inhabiting Cerambycids. U.S. Dep. Agric. For. Serv. Res. Note NE-258, 4 p. (NE)

Gibson, Lester P.

1978. Monograph of the genus *Curculio* in the New World (Coleoptera: Curculionidae) Part II. Mexico and Central America. Misc. Publ. Entomol. Soc. Amer. 10(4):1-52. (NE)

Hay, C. John.

1977. The effects of insects and air pollutants on the health and survival of trees. Am. Nurseryman 146:109-114. (NE)

Hertel, Gerard D., Isadore L. Williams, and Edward P. Merkel.

1977. Insect attacks on and mortality of slash and longleaf pines treated with paraquat to induce lightwood formation. U.S. Dep. Agric. For. Serv. Res. Pap. SE-169, 13 p. (SE)

Hodges, Ronald W., and Robert E. Stevens.

1977. Two new pine-feeding species of Coleotechnites (Gelechiidae) Lepid. Soc. 32(2):118-122. (RM)

Jennings, Daniel T., and Mark W. Houseweart.

1978. Sexing spruce budworm pupae. U.S. Dep. Agric. For. Serv. Res. Note NE-255, 2 p. (NE)

Livingston, R. Ladd, and Gary Daterman.

1977. Surveying for Douglas-fir tussock moth with pheromone. Bull. Entomol. Soc. Am. 23(3):172-174. (PNW)

Lorio, Peter L., Jr., and David O. Yandle.

1978. Distribution of lightning-induced southern pine beetle infestations. South. Lumberman 236(2921):12-13. (SO)

Mattison, W. J.

1978. The role of insects in the dynamics of cone production of red pine, *Pinus resinosa* Oecologia 33:327-349. (NC)

McClelland, W. T., F. P. Hain, C. J. DeMars, and others.

1978. Sampling bark beetle emergence: a review of methodologies, a proposal for standardization, and a new trap design. Bull. Entomol. Soc. Am. 24(2):137-140. (PSW)

Miller, W. E., K. J. Kessler, Jr., J. H. Ohman, and J. T. Eschle.

1978. Timber quality of northern hardwood regrowth in the Lake States. For. Sci. 24:247-259. (NC)

- Moore, G. E.  
1978. Factors for determining population trends in southern pine beetle spots. *Environ. Entomol.* 7(3):335-342. (SE)
- Moser, John C., and Lloyd E. Browne.  
1978. A nondestructive trap for *Dendroctonus frontalis* Zimmerman (Coleoptera: Scolytidae). *J. Chem. Ecol.* 4(1):1-7. (SO)
- Mosher, D. G., and L. F. Wilson.  
1977. Scotch pine deterioration in Michigan caused by pine root weevil complex. *Great Lakes Entomol.* 10:169-172. (NC)
- Nixon, P. L., and J. E. McPherson.  
1977. An annotated list of phytophagous insects collected on immature black walnut trees in southern Illinois. *Great Lakes Entomol.* 10(4): 211-222. (NC)
- Oliveria, Forrest L., and Donald T. Cooper.  
1977. Tolerance of cottonwood to damage by cottonwood leaf beetle. *In Proc. South. For. Tree Improv. Conf.* 14:213-217. (SO)
- Powell, J. A., and W. E. Miller.  
1978. Nearctic pine tip moths of the genus *Rhyacionia*: Biosystematic review (Lepidoptera: Tortricidae, Olethreutinae). *U.S. Dep. Agric., Agric. Handb.* No. 514, 51 p. (NC)
- Solomon, James D., and Joe R. Cook.  
1978. Epidemic 1977—year of the hardwood lepidopterous defoliators. (Abstr.) *J. Miss. Acad. Sci.* 23 (suppl.):1. (SO)
- Solomon, James D., Mary E. Dix, and Robert E. Doolittle.  
1978. Attractiveness of the synthetic carpenterworm sex attractant increased by isomeric mixtures and prolonged by preservatives. *Environ. Entomol.* 7(1):39-41. (SO)
- Surgeoner, Gordon A., and William E. Walther.  
1978. Foliage consumption by the variable oak leaf caterpillar, *Heterocampa manteo* (Lepidoptera: Notodontidae), its use in defoliation predictions. *Can. Entomol.* 110:241-244. (NE)
- Talerico, R. L., and R. W. Wilson.  
1978. A sampling device for counting insect egg clusters and measuring vertical distribution of vegetation. *U.S. Dep. Agric. For. Serv. Res. Note NE-250.* (NE)
- Theroux, L. J., and G. E. Long.  
1978. Linear measurement: a method of estimating fascicle numbers for larch casebearer population sampling. *U.S. Dep. Agric. For. Serv. Res. Note INT-245.* 8 p. (INT)
- Valentine, H. T.  
1978. Estimating defoliation of hardwoods using blade-petiole relations. *U.S. Dep. Agric. For. Serv. Res. Paper NE-405.* (NE)
- Wagner, T. L., W. J. Mattson, and J. A. Witter.  
1977. A survey of soil invertebrates in two aspen forests in northern Minnesota. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep.* 40, 23 p. (NC)
- Wargo, Philip M.  
1978. Defoliation by the gypsy moth: how it hurts your tree. *U.S. Dep. Agric. Home and Garden Bull.* 223, 15 p. (NE)
- Wickman, Boyd E.  
1978. Tree mortality and top-kill related to defoliation by the Douglas-fir tussock moth in the Blue Mountains outbreak. *U.S. Dep. Agric. For. Serv. Res. Pap.* PNW-233, 47 p., illus. (PNW)
- Williams, Isadore L., and Carl W. Fatzinger.  
1977. A new cone midge, *Cecidomyia* sp. (Diptera: Cecidomyiidae) affecting slash pine cones. *In Proc. South. For. Tree Improv. Conf.* 14:104-107. (SE)
- Williams, Lonnie H.  
1978. A progress report on quarantine control of wood-products insects. *In 12th Meeting of study group on forest insects and diseases.* *North Am. For. Comm. (FAO).* (SO)
- Wilson, R. W., and G. A. Fontaine.  
1978. Gypsy moth egg-mass sampling with fixed- and variable-radius plots. *U.S. Dep. Agric., Agric. Handb.* 523. (NE)
- Yates, H. O., III, and B. H. Ebel.  
1978. Impact of insect damage on loblolly pine seed production. *J. Econ. Entomol.* 71:345-349. (SE)

## Environmental Hazard Evaluation

- LaGasa, Eric H., and Stamford D. Smith.  
1978. Improved insect emergence trap for stream community population sampling. *U.S. Dep. Agric. For. Serv. Res. Note PSW-328*, 3 p. (PSW)
- Lautenschlager, R. A., and J. D. Podgwaite.  
1977. Passage of infectious nuclear polyhedrosis virus through the alimentary tracts of two small mammal predators of the gypsy moth, *Lymantria dispar* L. *Environ. Entomol.* 6:737-738. (NE)
- Podgwaite, J. D., and P. R. Galipeau.  
1978. Effect of nucleopolyhedrosis virus on two avian predators of the gypsy moth. *U.S. Dep. Agric. For. Serv. Res. Note NE-251.* 2 p. (NE)

Shea, Patrick J.

1977. Testing of chemical and microbial insecticides for safety . . . some techniques. Bull. Entomol. Soc. Am. 23(3):176-178. (PNW)

## General

- Biel, Allen J., John M. Brand, Allen J. Markovetz, and John R. Bridges.  
1978. Dimorphism in *Ceratocystis minor* var. *barrasii*. Mycopathologia 62(3):179-182. (SO)
- Campbell, Robert W., and Max W. McFadden.  
1977. Design of a pest management research and development program. Bull. Entomol. Soc. Am. 23(3): 216-220. (PNW)
- Campbell, Robert W., Kenneth H. Wright, Max W. McFadden, and Jerald E. Dewey.  
1978. USDA Douglas-fir tussock moth research and development program. J. For. 76(1):37-40, illus. (PNW)
- Clark, E. W., and J. A. Richmond.  
1977. Variations of free and triglyceride fatty acids in phloem of *Pinus taeda* infected by *Ceratocystis minor*. Turrialba 27(4):377-383. (SE)
- Crisp, C. E., and M. Look.  
1978. The weak hypothesis for phloem loading. (Abstr.) p. IV-6. In Proc. 4th Int. Congr. Pesti. Chem. (PSW)
- Furniss, R. L., and V. M. Carolin.  
1977. Western forest insects. U.S. Dep. Agric. Misc. Publ. 1339, 654 p., illus. (PNW)
- Hay, C. John.  
1977. Bibliography on arthropoda and air pollution. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-34, 16 p. (NE)
- Hughes, Kenneth M.  
1978. The Laboratory of insect pathology at the university of California: the first decade. Bull. Entomol. Soc. Am. 24(1):25-28. (PNW)
- Hughes, Kenneth M.  
1978. The macromolecular lattices of polyhedra. J. Invertebr. Pathol. 31:217-224, illus. (PNW)
- Lorio, Peter L., Jr.  
1978. Researching the southern pine beetle. Ames For. 65:15-16. (SO)
- Marler, James E., and Stanley J. Barras.  
1978. A simple method for the production of microbe-free southern pine beetles. J. Ga. Entomol. Soc. 13(2):121-124. (SO)

McManus, Michael L.

1978. Expanded gypsy moth research and development program. J. For. 76(3):144-149. (NE)
- Podgwaite, J. D., and R. B. Bruen.  
1978. Procedures of the microbiological examination of production batch preparations of the nuclear polyhedrosis virus (Baculovirus) of the gypsy moth, *Lymantria dispar* L. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-38, 8 p. (NE)
- Rohrmann, G. F., M. E. Martignoni, and G. S. Beaudreau.  
1978. Quantification of two viruses in technical preparations of *Orygia pseudotsugata* Baculovirus by means of buoyant density centrifugation of viral deoxyribonucleic acid. Appl. and Environ. Microbiol. 35(4):690-693, illus. (PNW)
- Smith, Lawrence M., Ronald G. Smith, Thomas M. Loehr, and others.  
1978. Douglas fir tussock moth pheromone: identification of a diene analogue of the principal attractant and synthesis of stereochemically defined 1,6-, 2,6-, and 3,6-heneicosadien-11-ones. J. Org. Chem. 43:2361-2366, illus. (PNW)
- Smith, Richard H.  
1977. Monoterpenes of ponderosa pine xylem resin in western United States. U.S. Dep. Agric. For. Serv. Tech. Bull. 1532, 48 p., illus. (PSW)
- Thompson, Clarence G., and Linda J. Peterson.  
1978. Rearing the Douglas-fir tussock moth. U.S. Dep. Agric., Agric. Handb. 520, 17 p., illus. (PNW)
- Wargo, Philip M.  
1978. Correlations of leaf length and width measurements with leaf area in black oak, white oak, and sugar maple. U.S. Dep. Agric. For. Serv. Res. Note No. 256. (NE)
- Wright, K. H. (moderator)  
1977. The Douglas-fir tussock moth research and development program. Bull. Entomol. Soc. Am. 23(3):167-168. (PNW)

## Pest Management Systems

- Bergstrom, Dorothy.  
1977. Scientists create a model tussock moth outbreak. In For. Res.: What's New in the West, October 1977, p. 14-17, illus. (PNW)
- Campbell, Robert W.  
1977. Integration of program outputs: development of a pest management system. Bull. Entomol. Soc. Am. 23(3):179-180. (PNW)

## insects and diseases

- Cuthbert, Roy A., and John W. Peacock.  
1977. An estimate of the effectiveness of pheromone-baited traps for the suppression of *Scolytus multistriatus* (Coleoptera: Scolytidae). J. Chem. Ecol. 3:527-537. (NE)
- Stage, Albert R., and Garrell E. Long.  
1977. Forest stand dynamics as a basis for integrated management of forest pests. In The bases for integrated pest management, p. 19-27. Proc. Group 6, XVI IUFRO World Congress, Oslo, Norway. (INT)
- Talerico, R. L., C. M. Newton, and H. T. Valentine.  
1978. Pest-control decisions by decision-tree analysis. J. For. 76:16-19. (NE)
- Yates, H. O., III.  
1977. Seed orchard pest management strategies. In South. For. Tree Improv. Conf. Proc. 14:88-99. (SE)

## Population Dynamics

- Long, G. E.  
1977. Spatial dispersion in a biological control model for larch casebearer (*Coleophora laricella*). Environ. Entomol. 6:843-851. (INT)
- Mason, Richard R.  
1978. Tussock moth life tables. In McGraw-Hill yearbook of science and technology. p. 181-183, illus. McGraw-Hill Book Co., New York. (PNW)
- Mason, Richard R.  
1977. Advances in understanding population dynamics of the Douglas-fir tussock moth. Bull. Entomol. Soc. Am. 23(3):168-171. (PNW)
- Mason, Richard R., R. C. Beckwith, and H. Gene Paul.  
1977. Fecundity reduction during collapse of a Douglas-fir tussock moth outbreak in northeast Oregon. Environ. Entomol. 6(5):623-626. (PNW)

## Suppression and Prevention Techniques

- Barger, Jack H.  
1978. Smaller European elm bark beetle panel tests, 1975. Insectic. and Acar. Tests 3:143. (NE)
- Barger, Jack H.  
1978. Smaller European elm bark beetle bole bioassay tests, 1976.

## Insectic. and Acar. Tests 3:142. (NE)

- Bergstrom, Dorothy.  
1978. Parasite gains on the larch casebearer. In For. Res.: What's New in the West. July 1978, p. 6-9, illus. (PNW)
- Birch, Martin C., Richard W. Bushing, Timothy D. Paine, and others.  
1977. Pheromone traps to suppress populations of the smaller European elm bark beetle. Calif. Agric. 31(11):4-6. (NE)
- Birch, M. C., D. M. Light, and K. Mori.  
1977. Selective inhibition of response of *Ips pini* to its pheromone by the (s)-(-)-enantiomer of ipsenol. Nature:270, 738-739. (PSW)
- Browne, L. E.  
1978. A trapping system for the western pine beetle using attractive pheromones. J. Chem. Ecol. 4(3):261-275. (PSW)
- Busillo, A. E., and A. T. Drooz.  
1977. Cooperative establishment of a Virginia (USA) strain of *Tele-nomus alophilae* on *Oxydia trychiata* in Colombia. J. Econ. Entomol. 70(6):767-770. (SE)
- Campbell, Robert W., Ronald J. Sloan, and Cynthia E. Biazak.  
1978. Sources of mortality among late instar gypsy moth larvae in sparse populations. Environ. Entomol. 6(6):865-871. (NE)
- Ciesla, William M.  
1977. Douglas-fir tussock moth: direct control with chemical and microbial insecticides. Bull. Entomol. Soc. Am. 23(3):174-176. (PNW)
- DeBarr, G. L.  
1977. Registration and use of carbofuran (Furadan) in southern pine seed orchards. In Proc. Southeast. Area For. Tree Nurserymen's Conf. 1976:123-125. (SE)
- DeBarr, G. L., and V. H. Fedde.  
1978. Contact toxicity of three pyrethroids to the fall cankerworm, *Alsophila pometaria*. J. Ga. Entomol. Soc. 13:185-186. (SE)
- DeBlois, R. W., E. E. Uzgritis, D. H. Cluxton, and H. M. Mazzone.  
1977. Comparative measurements of size and polydispersity of several insect viruses. Gen. Electric Corp. Tech. Rep. #77CRD250, December 1977. (NE)
- Drooz, A. T., L. C. Thompson, and H. M. Kulman.  
1977. Release of *Olesicampe benefactor* against the larch sawfly in Eastern United States. J. Elisha Mitchell Sci. Soc. 93(2):89. (SE)
- Frye, R. H., J. M. Schmid, C. K. Lister, and P. E. Buffam.  
1977. Post-attack injection of Silvistar 510 (cacodylic acid) in spruce beetle (Coleoptera: Scolytidae) infested trees. Can. Entomol.



- 109(9):1221-1225. (RM)
- Gillette, Nancy L., and Jacqueline L. Robertson.  
1978. Feeding toxicity of carbofuran to mountain pine cone beetle, 1976. Insectic. and Acar. Tests 3:148. (PSW)
- Gillette, N. L., J. L. Robertson, and R. L. Lyon.  
1978. Bioassays of TH6038 and difluron applied to western spruce budworm and Douglas-fir tussock moth. J. Econ. Entomol. 71:319-22. (PSW)
- Hard, John, Steven Ilnysky, and James D. Ward.  
1978. Control of Douglas-fir tussock moth by aerially applied Dimilin (TH 6040). U.S. Dep. Agric. For. Serv. Res. Pap., PSW-130, 6 p. (PSW)
- Hastings, A. R., L. F. Wilson, and G. W. Hecht.  
1978. How to identify and control pine engraver beetle damage. U.S. Dep. Agric. For. Serv. Leaflet, 4 p. (NC)
- Koerber, Thomas W.  
1978. Solutions to seed insect problems. p. 63. In Proc. 1977 West. For. Conf. Exec. Summaries. (PSW)
- Lewis, F. B.  
1978. Mixing and applying microbials. p. 25-29. In Proc. Workshop on Aerial Appl. Insectic. against For. Defoliators. (NE)
- Look, M.  
1978. Adding tracer reduces effectiveness of acephate. U.S. Dep. Agric. For. Serv. Res. Note PSW-333. 4 p. (PSW)
- Markin, George P., J. Wayne Brewer, and Harold O. Batzer.  
1978. Field life of Orthenes, Sevin-4-oil and Dylox 1.5 bioassay with Douglas-fir tussock moth larvae. U.S. Dep. Agric. For. Serv. Res. Note PNW-313. 6 p., illus. (PNW)
- Martignoni, Mauro E., and Paul J. Iwai.  
1977. Peroral bioassay of technical-grade preparations of the Douglas-fir tussock moth nucleopolyhedrosis virus (*Baculovirus*). U.S. Dep. Agric. For. Serv. Res. Pap. PNW-222. 12 p., illus. (PNW)
- Martignoni, Mauro E., and Paul J. Iwai.  
1978. Activity standardization of technical preparations of Douglas-fir tussock moth *Baculovirus*. J. Econ. Entomol. 71(3):473-476. (PNW)
- Martignoni, Mauro E., and Paul J. Iwai.  
1977. Thermal inactivation characteristics of two strains of nucleopolyhedrosis virus (*Baculovirus* subgroup A) pathogenic for *Orgyia pseudotsugata*. J. Invertebr. Pathol. 30:255-262. (PNW)
- Merkel, Edward P., Carl W. Fatzinger, and Lee Draper, Jr.  
1977. Evaluation of carbofuran for the control of thrips, coneworms, and seedbugs in a slash pine seed orchard. In Proc. South. For. Tree Improv. Conf. 14:116-121. (SE)
- Miller, Mitchell C., W. Adrian Chappell, William C. Gamble, and John R. Bridges.  
1978. Antiserum preparation for immunodiffusion in southern pine beetle predation studies. U.S. Dep. Agric. For. Serv. Res. Note SO-233. 5 p. (SO)
- Mitchell, Russel G., and John Neissess.  
1977. Field test of acephate against two Douglas-fir Christmas tree pests. U.S. Dep. Agric. For. Serv. Res. Note PNW-302. 7 p., illus. (PNW)
- Montgomery, Michael E., and David G. Nielsen.  
1978. Dips for control of black vine weevil larvae in pots. Insectic. and Acar. Tests 3:161, Entomol. Soc. Am. (NE)
- Moore, G. E., and H. F. Layman.  
1978. Attempts to increase resistance of loblolly pines to bark beetles by fertilization. U.S. Dep. Agric. For. Serv. Res. Note SE-260. 4 p. (SE)
- Moser, John C., Bohdan Kielczewski, Jerzy Wisniewski, and Stanislaw Balazy.  
1978. Evaluating *Pyemotes dryas* (Vitzthum 1923) (Acari:Pyemotidae) as a parasite of the southern pine beetle. Int. J. Acar. 4(2):67-70. (SO)
- Neissess, J. A., and H. B. Hubbard.  
1978. Application of microbial insecticides on forests. Misc. Publ. 10(5):27-43, illus. Entomol. Soc. Am. (PNW)
- Nord, J. C.  
1978. Field test of four insecticides for control of pales and pitch-eating weevils in first-year pine plantations. U. S. Dep. Agric. For. Serv. Res. Note SE-255. 9 p. (SE)
- Nord, J. C.  
1978. Field test of granular carbofuran for control of the Nantucket pine tip moth in pine plantations. U. S. Dep. Agric. For. Serv. Res. Note SE-261, 8 p. (SE)
- Page, Marion, and Lula Greene.  
1978. *Scolytus multistriatus*, laboratory bioassay, 1974-75. Insectic. and Acar. Tests 3:143. (PSW)
- Richmond, J. A.  
1977. Dermal toxicity of four chemosterilants applied to Nantucket pine tip moth. J. Elisha Mitchell Sci. Soc. 93(2):91. (SE)

- Richmond, J. A., A. B. DeMillo, H. A. Thomas, and A. B. Borkovec.  
1978. Mortality and sterility of southern pine beetles treated with chemosterilants and growth regulators. J. Ga. Entomol. Soc. 13(3): 237-240. (SE)
- Robertson, Jacqueline L.  
1978. Feeding tests of insecticides, 1975. Insectic. and Acar. Tests 3:145. (PSW)
- Robertson, Jacqueline L.  
1978. Laboratory tests of insecticides on western spruce budworm, 1976-77. Insectic. and Acar. Tests 3:145-46. (PSW)
- Robertson, Jacqueline L., Carl E. Crisp, and Melvin Look.  
1978. Contact toxicity of O,O-dimethyl 2,2,2-trichloro-1-hydroxyethyl phosphonate and its acyloxy and vinyl derivatives, 1970-71. Insectic. and Acar. Tests 3:144-45. (PSW)
- Robertson, Jacqueline, and Nancy L. Gillette.  
1978. Contact toxicity of insecticides to western pine beetle, 1977. Insectic. and acar. Tests 3:147. (PSW)
- Robertson, Jacqueline L., and Richard A. Kimball.  
1978. Feeding toxicity of insecticides to western pine beetle, 1977. Insectic. and Acar. Tests 3:148. (PSW)
- Rohrmann, G. F., J. W. Carnegie, M. E. Martignoni, and G. S. Beaudreau.  
1977. Characterization of the genome of the nucleopolyhedrosis bun-  
dle virus pathogenic for *Orygia pseudotsugata*. (PNW)
- Rohrmann, G. F., R. H. McParland, M. E. Martignoni, and G. S. Beau-  
dreau.  
1978. Genetic relatedness of two nucleopolyhedrosis viruses patho-  
genic for *Orygia pseudotsugata*. Virology 84:213-217, illus. (PNW)
- Roton, Lawrence M.  
1978. Mites phoretic on the southern pine beetle: when and where  
they attack. Can. Entomol. 103:557-558. (SO)
- Solomon, James D.  
1978. Impact and control of insect borers in southern hardwoods,  
p. 94-100. In Proc. 2d Symp. Southeastern Hardwoods. (SO)
- Sower, L. L., and G. E. Dateman.  
1977. Evaluation of synthetic sex pheromone as control agent for  
Douglas-fir tussock moths. Environ. Entomol. 6(6):889-892, illus.  
(PNW)
- Thomas, H. A., and G. D. Hertel.  
1977. Development of trapping techniques for the pales weevil. J.  
Elisha Mitchell Sci. Soc. 93(2):90-91. (SE)
- Thompson, C. G., John Neissess, and Harold O. Batzer.  
1977. Field tests of *Bacillus thuringiensis* and aerial application strate-  
gies on western mountainous terrain. U.S. Dep. Agric. For. Serv.  
Res. Pap. PNW-230. 12 p., illus. (PNW)
- Wernz, J., and G. P. Markin.  
1978. Flow rates and characteristics of Dimilin, Dylox 1.5, Orthene  
75S, and Sevin-4-oil. U.S. Dep. Agric. For. Serv. Res. Note PNW-  
300. 17 p. (PNW)
- Williams, Carroll B., Jr., George P. Markin, and Patrick J. Shea.  
1978. Effects of carbaryl, trichlorfon, and DDT on collapsing Douglas-  
fir tussock moth populations in Oregon. U.S. Dep. Agric. For. Serv.  
Res. Note PSW-334. 7 p. (PSW)
- Williams, Carroll B., Jr., Patrick J. Shea, Bohdan Maksymiuk, and others.  
1978. Aerial application of mexacarbate and stabilized pyrethrins on  
Douglas-fir tussock moth populations. U.S. Dep. Agric. For. Serv.  
Res. Note PSE-322. 6 p. (PSW)
- Wollam, J. D., W. G. Yendol, and F. B. Lewis.  
1978. Evaluation of aerially-applied nuclear polyhedrosis virus for  
suppression of gypsy moth *Lymantria dispar* L. U. S. Dep. Agric.  
For. Serv. Res. Pap. NE-396, 8 p. (NE)
- Young, J. W., T. M. Graves, R. Curtis, and M. M. Furniss.  
1977. Controlled release formulations of insect growth regulators and  
pheromones: evaluation methods and field test results. In: ACS  
symposium series No. 53. Controlled release pesticides, p. 184-199.  
Amer. Chem. Soc., 205 p. (INT)

## PRODUCTS AND ENGINEERING

### Engineering

- Arola, Rodger A.  
1978. Fiber for structural flakeboard-mechanized thinning and top-  
wood recovery. In Structural flakeboard from forest residues sym-  
posium proceedings, p. 13-32. For. Prod. Res. Soc. (NC)
- Billier, Cleveland J.  
1977. A hydraulic assist for a manual skyline lock. U. S. Dep. Agric.  
For. Serv. Res. Note NE-247. 2 p. (NE)
- Billier, Cleveland J., and Harry G. Gibson.  
1978. Testing the chuball for selective logging on Appalachian slopes,

- p 18, 19, & 34. Northern Logger, June 1978. (NE)
- Carson, Ward W.  
1977. Analysis of the single cable segment. *For. Sci.* 23(2):238-252. (PNW)
- Fisher, Edward L.  
1978. Measurement and abatement of noise in the timber harvesting industry. MSIE Thesis, West Va. Univ. (NE)
- Gardner, R. B.  
1978. Cost, performance, and esthetic impacts of an experimental forest road in Montana. U.S. Dep. Agric. *For. Serv. Res. Pap.* INT-203. (INT)
- Gardner, R. B., William S. Hartsog, and Kelly B. Dye.  
1978. Road design guidelines for the Idaho Batholith based on the China Glenn Road Study. U.S. Dep. Agric. *For. Serv. Res. Pap.* INT-204. (INT)
- Gardner, Rulon G., Erwin L. Schaffer, and John R. Erickson.  
1978. Converting forest residue to structural flakeboard—the fingerling concept. U.S. Dep. Agric. *For. Serv. Res. Pap.* INT-200. (INT)
- Gibson, D. F., T. Lehman, and Ed Mooney.  
1978. Interactive computer planning of surface coal mining operations. *In* International congress for energy and the ecosystem: planning, ecology, and economy for coal resource development. Univ. N. Dak. 6 p. (INT)
- Gibson, D. F., Ed Mooney, and G. A. Sattoriva.  
1977. A minicomputer system for planning surface mining operations. *In* Proc. AIIE Systems Engr. Conf. 9 p. (INT)
- Hartsog, William S.  
1978. Balloon logging in the Idaho Batholith—a feasibility study. U.S. Dep. Agric. *For. Serv. Res. Pap.* INT-208. (INT)
- Host, John, and Joyce Schlieter.  
1978. Low-cost harvesting systems for intensive utilization in small-stem lodgepole pine stands. U.S. Dep. Agric. *For. Serv. Res. Pap.* INT-201. (INT)
- Johnston, R. S.  
1978. Runoff and sediment contribution from surface mine roads. *In* ASAE Summer Meet., Logan, Utah. (INT)
- Mattson, James A., R. A. Arola, and W. A. Hillstrom.  
1978. Recovering and chipping hardwood cull trees having heavy limbs, p. 120-130. *In* Proc. Complete-Tree Util. South. Pine Symp. (NC)
- Mattson, James A., D. P. Bradley, E. Carpenter, and others.  
1978. Forest residues energy program—final report. 297 p. (NC)

- Pacific Northwest Forest and Range Experiment Station (Louise Parker)  
1978. The peewee yarder. U.S. Dep. Agric. *For. Serv. Inf. Leaflet*, illus. (PNW)
- Poole, D. R., E. S. Sundberg, J. D. Armijo, and A. C. Scheer.  
1978. Effects of mine haul roads on the water resource—User's guide —ROSED. Civil Eng. Eng. Mechanics Dep., Montana State Univ. 33 p. (INT)
- Sauder, B. J., and M. Nagy.  
1977. Coast logging: highlead versus long-reach alternatives. *FERIC Tech. Rep.* TR-19, 113 p., illus. *For. Eng. Res. Inst. Can., Vancouver, B.C.* (PNW)
- Sirois, Donald L.  
1977. Feasibility of harvesting southern hardwood trees by extraction. *In* ASAE Tech. Pap. 77-1567. 1977 Winter Meet., Am. Soc. Agric. Eng. (SO)
- Sirois, Donald L., and Ronald H. Iff.  
1978. Is there a potential for skyline logging of southern pines? *In* Complete-tree utilization of southern pines symposium proceedings, p. 203-210. *For. Prod. Res. Soc.* (SO)
- Sturos, J. A., J. B. Crist, J. G. Isebrands, and N. D. Nelson.  
1978. Harvesting and beneficiation of whole-tree chips from three short intensively cultured rotation species. (Abstr.) p. 5. *In* FPRS Annu. Meet. Proc. (NC)
- Sturos, John A., and John Marvin.  
1978. A process for removing bark, foliage, and grit from southern pine whole-tree chips. *In* Complete-tree utilization of southern pine symposium proceedings, p. 277-294. *For. Prod. Res. Soc.* (NC)
- Twito, Roger H.  
1977. Plotting landscape perspectives. *In* Forests for people—a challenge in world affairs, p. 335-337, illus. *Proc. Soc. Am. For.* 1977 Nat. Conv. (PNW)
- Williams, J. O., K. T. Meehan, and G. L. Houck.  
1978. LINEAR: a computer program for manipulating linear data. Idaho Bur. Mines and Geol., IBMG Open-file Rep. 78-4. 58 p. (INT)

## Products Utilization

- Adams, Thomas C.  
1978. Opportunities for structural flakeboard production in the Pacific

- Northwest. *In* Structural flakeboard from forest residues symposium proceedings. For. Prod. Res. Soc. (PNW)
- Baker, Andrew J.
  1977. Wood as animal feed. McGraw-Hill 1977 yearbook of science and technology, p. 231-232. McGraw-Hill Book Co., New York (FPL)
- Baker, Andrew J., and Jerome F. Saeman.
  1978. Forest products industry energy needs—significance and trends. *In* Proc. Am. Inst. Chem. Eng. Sym. (FPL)
- Barquest, Glenn, Theodore Brevik, William Feist, and Howard Larsen.
  1977. Interior finishes for milkhouses and milking parlors. Univ. Wis. Ext. Publ. No. A2871, July. (FPL)
- Barquest, Glenn, Theodore Brevik, William Feist, and Howard Larsen.
  1977. Interior finishes for stall or stanchion barns. Univ. Wis. Ext. Publ. No. 2870, July. (FPL)
- Barquest, Glenn, Theodore Brevik, Howard Larsen, and William Feist.
  1978. What should be put on milk house and parlor walls? Hoard's Dairyman 123(10): 668, 706. (FPL)
- Barquest, Glenn, William C. Feist, and Dick Stith.
  1978. When paint peels severely from wood. Univ. Wis. Ext. Publ. No. A2485, July. (FPL)
- Bendtsen, B. A., and W. L. Galligan.
  1978. Trenching lumber: stress derivation and use recommendations. Rep. Natl. Bur. Stand. (Unnumbered publ.). (FPL)
- Bendtsen, B. A., J. Haskell, and W. L. Galligan.
  1978. Characterizing the stress-compression relationship of wood in compression perpendicular to grain. Wood Sci. 10(3):111-121. (FPL)
- Bendtsen, B. A., and S. Porter.
  1978. Comparison of results from standard 2-inch with 1-1/2-inch shear block tests. For. Prod. J. 28(7):54-56.
- Benson, Robert E., and Richard A. Strong.
  1977. Wood product potential in mature lodgepole pine stands, Bitterroot National Forest. U.S. Dep. Agric. For. Serv. Res. Pap. INT-194. (INT)
- Bingham, Samuel A., and J. G. Schroeder.
  1977. Short lumber in furniture manufacture. Wood and Wood Prod. 82(11):78-79. (SE)
- Braun, M. O., and R. C. Moody.
  1977. Bending strength of small glulam beams with a laminated veneer tension lamination. For. Prod. J. 27(11):46-51. (FPL)
- Brown, Clair A., and Harold E. Grelen.
  1977. Identifying hardwoods growing on pine sites. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. SO-15. 69 p. (SO)
- Bulgryn, E. H., G. B. Harpole, and E. Williston.
  1978. Edge, glue, and rip: The EGAR program. *In* Modern sawmill techniques, p. 18-25. Proc. 8th Sawmill Clinic. (FPL)
- Byrd, Von L., and John W. Koning, Jr.
  1978. Corrugated fiberboards edgewise compression creep in cyclic relative humidity environments. Tappi 61(6):35-37. (FPL)
- Caulfield, D. F.
  1978. Effect of cellulose on the structure of water: view II. *In* Fibre-water interactions in paper-making proceedings. British Pap. and Board Ind. Fed. William Clowes & Sons Ltd., London. (FPL)
- Caulfield D. F., and R. C. Weatherwax.
  1978. Tensile modulus of paper wet-stiffened by crosslinking. *In* Fibre-water interactions of paper-making proceedings. British Pap. and Board Ind. Fed. William Clowes & Sons Ltd., London. (FPL)
- Chen, Peter Y. S.
  1978. Press-drying black walnut wood: continuous drying vs. step-drying. For. Prod. J. 28(1):23-25. (NC)
- Chen, Peter Y. S., Edward C. Workman, Jr., and Charles E. Helton.
  1978. How to build a collector for a solar kiln with aluminum cans. FPRS News-Digest, Processes: Drying and Storage, February 1978, File: G-1.4. 4 p.
- Chudnoff, M., W. E. Eslyn, and R. Wawriw.
  1978. Effectiveness of groundline treatments of creosoted pine poles under tropical exposure. For. Prod. J. 28(4):28-32. (FPL)
- Clarke, Edward H., and John W. Henley.
  1978. Unused mill residuals may all serve as fuel. For. Ind. 105(2): 54-55, illus. (PNW)
- Coleman, Ronald E.
  1977. SEMTAP (serpentine end match tape program) the easy way to program your numerically controlled router for the production of SEM joints. U.S. Dep. Agric. For. Serv. Res. Pap. NE-384. 5 p., illus. (NE)
- Connors, W. J.
  1978. Gel chromatography of lignins, lignin model compounds, and polystyrenes using Sephadex LH-60. *Holzforschung* 32(4). (FPL)
- Connors, W. J., L. F. Lorenz, and T. K. Kirk.
  1978. Chromatographic separation of lignin models by molecular weight using Sephadex LH-20. *Holzforschung* 32(3):106-108. (FPL)

- Crist, J. B., J. G. Isenbrands, J. D. Sinkey, and W. L. Bohn.  
1978. Thermo-mechanical pulping of 3 short-rotation intensively cultured species. (Abstr.), p.21. *In* Proc. Annu. Meet. For. Prod. Res. Soc. (NC)
- Danielson, J.  
1978. Automatic control for southern pine sawmills. *In* Complete tree utilization of southern pine symposium proceedings. For. Prod. Res. Soc. (FPL)
- DeGroot, R. C., and W. E. Eslyn.  
1978. Save wood—end-treat stored maple and birch logs. Res. and Applic. (Unnumbered publ.) (FPL)
- Duff, J. E.  
1978. Response of on-site built homes for energy conservation symposium proceedings. *In* Energy efficiency in wood-building construction. Proc. For. Prod. Res. Soc. No. P-77-18:37-44. (SE)
- Effland, Marilyn J.  
1977. Modified procedure to determine acid-insoluble lignin in wood and pulp. Tappi 60(10):143-144. (FPL)
- Eickner, H. W.  
1977. Surface flammability measurements for building materials and related products. Treatise, Anal. Chem. 4(3):1-56. John Wiley and Sons, Inc. (FPL)
- Fahey, Thomas D.  
1978. Veneer recovery at a high-speed core lathe. For. Prod. J. 28(4):19-20, illus. (PNW)
- Fahey, D. J., and J. F. Laundrie.  
1978. Market pulp and white papers from mixed tropical hardwoods. *In* Proc. Int. Conf. Improved Util. Tropical For. (FPL)
- Faurot, J. L.  
1977. Estimating merchantable volume and stem residue in four timber species: ponderosa pine, lodgepole pine, western larch, Douglas-fir. U.S. Dep. Agric. For. Serv. Res. Pap. INT-196. (INT)
- Feist, W. C.  
1978. Protecting wooden structures, p. 160-162. Chemtech, March. (FPL)
- Feist, W. C.  
1978. Protecting woodwork without preservatives. Res. and Applic. Unnumbered Rep. (FPL)
- Feist, W. C., and E. A. Mraz.  
1978. Comparison of outdoor and accelerated weathering of unprotected softwoods. For. Prod. J. 28(3):38-43 (FPL)
- Feist, W. C., and E. A. Mraz.  
1978. Protecting millwork with water repellents. For. Prod. J. 28(5):31-35. (FPL)
- Feist, W. C., and E. A. Mraz.  
1978. Wood finishing. Water repellents and water-repellent preservatives. U.S. Dep. Agric. For. Serv. Res. Note FPL-0124, Rev. 7 p. (FPL)
- Galligan, William L., and Edwin Kallio.  
1977. Example of integrated research: influence of lumber properties on truss performance. For. Prod. J. 27(11):12-15. (FPL) (NC)
- Galligan, William L., and Edwin Kallio.  
1977. A study of truss fabrication, truss materials. Prof. Builders, Aug. 1977, p. 131. (FPL) (NC)
- Galligan, William L., Edwin Kallio, and Isaac Sheppard.  
1977. Lumber truss design—views of designers and regulatory agencies. For. Prod. J. 27(12):25-29. (FPL)
- Galligan, W. L., D. V. Snodgrass, and G. W. Crow.  
1978. MSR holds promise for some lumber producers. South. Lumberman 236(2929). (FPL)
- Geimer, R. L., and J. B. Crist.  
1978. Structural flakeboard from short-rotation intensively cultured hybrid poplar clones. (Abstr.) p. 9-10. *In* Proc. For. Prod. Res. Soc. Annu. Meet. (NC)
- Geimer, Robert L., and Eddie W. Price.  
1978. Construction variables considered in the fabrication of a structural flakeboard. *In* Structural flakeboard from forest residues symposium proceedings, p. 69-80. For. Prod. Res. Soc. (FPL)
- Gerhards, C. C.  
1978. Comparison of two nondestructive instruments for measuring pulse transit time in wood. Wood Sci. 11(1):13-16. (FPL)
- Gerhards, C. C.  
1978. Time-related effects of loads on strength of wood. *In* Environmental degradation of engineering materials conference proceedings. Col. Eng., Va. Polytechnic Inst. & State Univ. (FPL)
- Gillespie, R. H., D. Countryman, and R. F. Blomquist.  
1978. Adhesives in building construction. U. S. Dept. Agric., Agric. Handb. 516. (FPL)
- Gillespie, R. H., and W. D. Page.  
1977. Quality control of bonding in building construction. HUD, NTIS 275 867/OGA. (FPL)



- Gjovik, L. R.
  1977. Pretreatment of molding of southern pine: its effect on permanence and performance of preservatives exposed in seawater. *In* Proc. Am. Wood Pres. Assoc. 73-142-153. (FPL)
  - Proc. Am. Wood Pres. Assoc. 73-142-153. (FPL)
- Gjovik, L. R., and R. H. Baechler.
  1977. Selection, production, procurement, and use of preservative-treated wood, supplementing Federal specification TT-W-571. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. 15. (FPL)
- Grantham, John B.
  1978. Wood's future seems directed to energy ahead of chemicals. *For. Ind.* 105(2):52-53. (PNW)
- Hallock, H.
  1978. There IS more lumber in that log. *In* Modern sawmilling techniques. Proc. 8th Sawmill Clinic. (FPL)
- Hallock, H., and E. H. Bulgrin.
  1977. A look at yellow-poplar for studs. U.S. Dep. Agric. For. Serv. Res. Note FPL-0238. (FPL)
- Hallock, H., and E. H. Bulgrin.
  1978. SDR system for yellow-poplar studs. *In* Proc. Symp. on Mark. and Util. Yellow-Poplar. (FPL)
- Hanks, Leland F.
  1977. Predicted cubic-foot yields of lumber, sawdust, and sawmill residue from the sawtimber portions of hardwood trees. U.S. Dep. Agric. For. Serv. Res. Pap. NE-380. 23 p. (NE)
- Hans, G. E., R. L. Tuomi, and D. Sith.
  1977. Designing a truss-frame house for energy efficiency. *Am. Soc. Agric. Eng. Pap. No. 77-4548.* (FPL)
- Hansen, Bruce G., and Charles J. Gatchell.
  1978. Serpentine end matching: a test of visual perception. U.S. Dep. Agric. For. Serv. Res. Pap. NE-408. 5 p., illus. (NE)
- Harpole, G. B., E. M. Williston, and H. Y. Hallock.
  1977. EGAR process wide-dimension lumber from small logs. *South. Lumberman* 235(2919):62-64. (FPL)
- Harris, J. F.
  1978. Process alternatives for furfural production. *Tappi* 61(1):41-44. (FPL)
- Hemingway, Richard W.
  1978. Adhesives from southern pine bark—a review of past and current approaches to resin formulation problems. *In* Complete-tree utilization of southern pine symposium proceedings, p. 443-457. *For. Prod. Res. Soc. (SO)*
- Hemingway, Richard W., and Gerald W. McGraw.
  1978. Formaldehyde condensation products of model phenols for conifer bark tannins. *J. Liquid Chromatog.* 1(2):163-179. (SO)
- Hokanson, A. E., and R. M. Rowell.
  1977. Methanol from wood waste: a technical and economic study. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. 12 (FPL)
- Horn, Richard A.
  1978. Morphology of pulp fiber from hardwoods and influence on paper strength. U.S. Dep. Agric. For. Serv. Res. Pap. FPL 312.(FPL)
- Host, John, and Roger Pfenniger.
  1978. Plant nutrients in flyash from barkfired boilers. U.S. Dep. Agric. For. Serv. Res. Note INT-247. (INT)
- Hse, Chung-Yun.
  1978. Development of an improved adhesives system for southern pine plywood. *In* Complete-tree utilization of southern pine proceedings, p. 411-415. *For. Prod. Res. Soc. (SO)*
- Isebrands, J. G., and R. A. Parham.
  1978. On the nature of surface dislocations on *Populus* tension wood fibers. (Abstr.) p. 34. *In* Plant science conference proceedings. Bot. Soc. Am. Misc. Publ. 156. (NC)
- Johnson, B. R., and D. I. Gutzmer.
  1978. Ammoniacal copper borate: a new treatment for wood preservation. *For. Prod. J.* 28(2):33-36 (FPL)
- Jones, R. E.
  1978. How to design walls for desired STC ratings. *Sound and Vibration* 12(8):14-17. (FPL)
- Jones, R. E.
  1978. Sound insulation evaluation of high-performance wood-frame party partitions under laboratory and field conditions. U.S. Dep. Agric. For. Serv. Res. Pap. FPL-309. (FPL)
- Kaiserlik, J. H.
  1978. Nondestructive testing methods to predict effect of degradation on wood: a critical assessment. *For. Serv. For. Prod. Lab. Gen. Tech. Rep. FPL-19.* (FPL)
- Kelly, M. W., and R. G. Pearson.
  1977. Properties of veneered southern pine low-density fiberboard from hardwood total tree chips. *For. Prod. J.* 27(9):28. (SE)
- Kelly, M. W., and R. G. Pearson.
  1978. Strength of selected methods for joining low-density fiberboard. *For. Prod. J.* 28(8):29-33. (SE)
- Keyser, Paul, T. K. Kirk, and J. G. Zeikus.
  1978. Lignolytic enzyme system of *Phanerochaete chrysosporium*:

- synthesized in the absence of lignin in response to nitrogen starvation. *J. Bacteriol.* 135(9) (FPL)
- Kirk, T. Kent.
1977. Biodelignification research at the U.S. Forest Products Laboratory. *In* Biological delignification: present status and future directions, p. 31-54. Weyerhaeuser Co., Seattle. (FPL)
- Kirk, T. Kent, and C. H. Kirk.
1978. Wood deterioration. *In* McGraw-Hill 1978 Yearb. Sci. and Tech., p. 388-391. McGraw-Hill, N.Y. (FPL)
- Kirk, T. Kent, E. Schultz, W. J. Connors, L. F. Lorenz, and J. G. Zeikus.
1978. Influence of culture parameters on lignin metabolism by *Phanerochaete chrysosporium*. *Arch. Microbiol.* 117:277-285. (FPL)
- Kirk, T. Kent, H. H. Yang, and Paul Keyser.
1978. The chemistry and physiology of the fungal degradation of lignin. *Dev. Indust. Microbiol.* 19:51-61. (FPL)
- Knab, L. I., and R. C. Moody.
1978. Glulam design criteria for temporary structures. *J. Str. Div. ASCE*, 104(ST9):1485-1494. *Proc. Pap.* 14031. (FPL)
- Koch, Peter.
1977. Aus Wirtschaft und betrieb. biomasse: gewinnung und verarbeitung mit profilschalmaschinen. Holz als Roh- und Werkstoff 35(2): 41-44. (SO)
- Koch, Peter.
1976. Utilization of tree biomass from mixed-species forests—a non-pulp general solution, p. 78-82. *In* 1976 Rocky Mount. For. Ind. Conf. (SO)
- Koch, Peter.
1978. Utilization of southern hardwoods, p. 17-39. *In* Proc. 2d symp. Southeastern Hardwoods. (SO)
- Koch, Peter, and Conor W. Boyd.
1978. Effect of harvesting method on biomass removal from southern pine sites, p. 54-59. *In* Proc. Symp. on Princ. maint. Prod. on prepared sites. (SO)
- Koch, Peter, and Robert H. Caughey.
1977. Shaping-lathe headrig—key to profitable manufacture of solid-wood and molded-flake products from mixed hardwoods. (Abstr.) p. 27. *Proc., Mid-South Sect. For. Prod. Res. Soc.* (SO)
- Koch, Peter, Lloyd F. Day, and Martin T. Jasper.
1978. New suspension burner for green bark and hogged fuel—progress report on a commercial prototype. *In* Complete-tree utilization of southern pine symposium proceedings, p. 386-388. *For Prod. Res.*
- Soc. (SO)
- Koch, Peter, and Dan W. McKenzie.
1976. Machine to harvest slash, brush, and thinnings for fuel and fiber—a concept, p. 152-155. *In* Proc. Chaparral for energy, inf. exchange. (SO)
- Koch, Peter, and T. William Nicholson.
1978. Harvesting residual biomass and swathefelling with a mobile chipper. *In* Complete-tree utilization of southern pine symposium proceedings, p. 146-150. *For. Prod. Res. Soc.* (SO)
- Koch, Peter, and Walker L. Wellford, Jr.
1977. Some mechanical properties of small specimens cut from 1.79-inch-thick southern pine dried for 6 hours at 300°F and for 5 days at 180°F—comparison. *Wood and Fiber* 8:235-240. (SO)
- Koch, Peter, Walker L. Wellford, Jr., and Eddie Price.
1978. Continuous kiln dries southern pine studs nearly warp free in about 12 hours. *In* Complete-tree utilization of southern pine symposium proceedings, p. 365-371. *For. Prod. Res. Soc.* (SO)
- Koenigshof, Gerald A.
1977. Economic feasibility of producing composite panels. *In* Proc. Wash. State Univ. Symp. on Particleboard II:293-312. (SE)
- Koeppen, R. C.
1978. Some anatomical characteristics of tropical woods. *In* Proc Int. Conf. Improv. Trop. For., p. 25-37. (FPL)
- Koning, J. W., Jr.
1978. Compressive properties of linerboard as related to corrugated fiberboard containers. *TAPPI* 61(8):69-71. (FPL)
- Koning, J. W., Jr., J. F. Landrie, D. J. Fahey, and O. W. Bormett.
1978. Linerboard, corrugating medium, and corrugated containers from mixtures of tropical hardwoods. *In* Proc. Int. Conf. on Improv. Utili. Trop. For. (FPL)
- Koning, J. W., Jr., and R. K. Stern.
1977. Long-term creep in corrugated fiberboard containers. *TAPPI* 60(12):128-131. (FPL)
- Kukachka, B. F.
1978. Sectioning refractory woods for anatomical studies. *Micrographica Acta* 80:301-307. (FPL)
- Landucci, L. L.
1978. Metal-catalyzed phenoxy radical generation during lignin oxidation. *Can. Pulp and Paper Trans.* 4(1):25-29. (FPL)
- Landrie, J. F.
1978. Kraft and NSSC pulping of mixed tropical hardwoods. *In* Proc.

## products and engineering

- Int. Conf. on Improv. Util. Trop. For. (FPL)
- Lan, Su-Ting, and Howard N. Rosen.  
1978. Effect of the addition of waxes to wood-polymer composite. For. Prod. J. 28(2):36-39. (NC)
- Lehmann, William F.  
1978. Cyclic moisture conditions and their effect on strength and stability of structural flakeboards. For. Prod. J. 28(6):23-31. (FPL)
- Lehmann, William F.  
1977. Durability of composition board products. In Proc. Wash. State Univ. Symp. on Particleboard 11:351-368. (FPL)
- Lehmann, William F., and Harold E. Wahlgren.  
1978. Status and prospects of residue utilization in board manufacture in the United States and Canada. For. Prod. J. 28(7):24-29. (FPL)
- Lowery, David P., and Allen L. Hearst, Jr.  
1978. Moisture content of lumber produced from dead western white pine and lodgepole pine trees. U.S. Dep. Agric. For. Serv. Res. Pap. INT-212. (INT)
- Lundquist, Knut, and T. Kent Kirk.  
1978. *De novo* synthesis and decomposition of veratryl alcohol by a lignin-degrading basidiomycete. Phytochemistry 17(9). (FPL)
- Magers, K. D., C. G. Smith, and D. T. Sawyer.  
1978. Reversible binding of dioxygen by tris(3,5-ditert-butylcatecholato)manganese(III) in dimethyl sulfoxide. J. Am. Chem. Soc. 100:989-991. (FPL)
- Malcolm, Richard N.  
1978. A new method of building scale-model houses. U.S. Dep. Agric. For. Serv., Gen. Tech. Rep. SE-12. 9 p. (SE)
- Manwiller, Floyd G.  
1978. Southern pine properties related to complete-tree utilization—a review of the literature from 1971-1977. In Complete-tree utilization of southern pine symposium proceedings, p. 29-40. For. Prod. Res. Soc. (SO)
- McDonald, K. A.  
1978. Lumber defect detection by ultrasonics. U.S. Dep. Agric. For. Serv. Res. Pap. FPL 311 (FPL)
- McMillin, Charles W.  
1978. Development of the sequential velocity refiner—a new approach to mechanical pulping. Empire State Pap. Res. Inst. Res. Rep. 68: 91-107. (SO)
- McMillen, John M.  
1978. Overseas measures to improve initial seasoning and handling. Import/Export Wood Purch. News 4(5):4. (FPL)
- McMillen, John M.  
1978. Overseas protection of logs and lumber. Import/Export Wood Purch. News 4(5). (FPL)
- McNatt, J. Dobbin.  
1978. Linear regression of fatigue data. Wood Science 11(1):39-41. (FPL)
- McNatt, J. Dobbin.  
1978. Manufacture and performance of full-size structural flakeboards from Douglas-fir forest residues. In Proc. Struc. Flakeboard For. Residues Symp., p. 119-132. (FPL)
- McNatt, J. Dobbin.  
1977. Structural flakeboard—what is it? What can it do? South. Lumberman, 235(2919):83-85. (FPL)
- Miller, Regis B.  
1977. Vented pits in Boraginaceae. IAWA Bulletin 1977/3:43-48. (FPL)
- Murmanis, Lidija.  
1977. Development of vascular cambium into secondary tissue of *Quercus rubra* L. Ann. Bot. 41:617-620. (FPL)
- Murphy, Joseph F.  
1978. Using fracture mechanics to predict failure of notched wood beams. In Proc 1st Int. Conf. Wood Fract. (FPL)
- Myers, Gary C.  
1978. Hardboards from mixed tropical hardwoods. In Proc Int. Conf. Improv. Util. Trop. For., p. 275-283. (FPL)
- Myers, Gary C.  
1978. How adjusting fiber acidity improved strength of dry-formed hardboards. For. Prod. J. 28(3):48-50. (FPL)
- Neuhausser, E. F., R. Hartenstein, and W. J. Connors.  
1978. The role of soil macroinvertebrates in the degradation of vanillin, cinnamic acid, and lignins. Soil Biol. and Biochem. 10:2. (FPL)
- Oviatt, Alfred E., Jr.  
1978. Saving energy in the older home. U.S. Dep. Agric. For. Serv., 12 p. (Unnumbered publ.)
- Parham, R. A., K. W., Robinson, and J. G. Isebrands.  
1977. Effects of tension wood on kraft paper from a short rotation hardwood (*Populus Tristis* No. 1) Wood Sci. Tech. 11:291-303. (NC)
- Plank, Martin E., and Thomas A. Snellgrove.  
1978. An equation for estimating the value and volume of western larch trees. U.S. Dep. Agric. For. Serv. Res. Pap. PNW-231. 29 p., illus.

- (PNW)  
Price, Eddie W.  
1977. Basic properties of full-size structural flakeboards fabricated with flakes on a shaping lathe. *In* Proc. Wash. State Univ. Symp. on Particleboard 11:313-332. (SO)  
Price, Eddie W., and William F. Lehmann.  
1978. Current flaking practices and their effect on board properties. *In* Complete-tree utilization of southern pine symposium proceedings, p. 460-472. For. Prod. Res. Soc. (SO)  
Reynolds, Hugh W., and James Schroeder.  
1978. Furniture cuttings made from logging residue: the three-sided cant system. U.S. Dep. Agric. For. Serv., Res. Pap. NE-417. (NE)  
Rosen, Howard N.  
1978. Evaluation of drying times, drying rates, and evaporative fluxes when drying wood with impinging jets. *In* 1st international symposium on drying proceedings, p. 192-200. Science Press, Princeton, N.J. (NC)  
Rosen, Howard N.  
1977. Humidity control can be important when high temperature drying hardwoods. FPRS News-Digest, Processes: drying and storage, October 1977. File:G-2. 3 p. (NC)  
Rosen, Howard N.  
1978. Interaction of alcohols and organic acids with wood. *Wood Sci.* 10(3):151-157. (NC)  
Rosen, Howard N.  
1977. Prototype jet impingement dryer. *For. Prod. J.* 27(11):34-37. (NC)  
Rosen, Howard N., and Robert E. Bodkin.  
1978. Drying curves and wood quality of silver maple jet-dried at high temperature. *For. Prod. J.* 28(9):37-43. (NC)  
Rowe, J. W., and A. H. Connor.  
1978. Extractives in eastern hardwood—a review. U.S. Dep. Agric. For. Serv. Res. Pap. FPL 308. (FPL)  
Rowell, R. M.  
1978. Distribution of bonded chemicals in southern pine treated with alkylene oxides. *Wood Sci.* 10(4):193-197. (FPL)  
Rowell, R. M.  
1978. Nontoxic wood preservation treatments. *Wood and Wood Prod.* February. p. 81-82. (FPL)  
Rowell, R. M.  
1977. Nontoxic wood preserving process developed. *Fence Ind.* November. p. 25-26. (FPL)  
Rowell, R. M., and R. A. Young, eds.  
1978. Modified cellulotics. 361 p. Academic Press, New York. (FPL)  
Sachs, I. B.  
1978. Paraquat-induced lightwood in red pine observed in scanning electron and light microscopy. *SEM Proc.* 2:217-222. (FPL)  
Saeman, Jerome F.  
1978. Energy and materials considerations affecting demand and supply for wood. *Tex. For.* 19(2):3.  
Saeman, Jerome F., Robert M. Nonnemacher, Ronald J. Slinn, and others.  
1978. Report of task force on the findings of CORRIM. *J. For.* 76(3): 189-190.  
Sanders, W., F. Muchmore, and R. Tuomi.  
1978. Behavior of Alaskan native log stringer bridges. *In* Proc. Trans. Res. Bd. Bridge Eng. Conf. September. (FPL)  
Sanyer, N.  
1978. Outlook for wood cellulose. *In* Modified cellulotics, p. 65-79. Academic Press, Inc., New York. (FPL)  
Schaffer, E. L.  
1978. State of structural timber fire endurance. *Wood and Fiber* 9(2): 145-170. (FPL)  
Schaffer, E. L.  
1978. Trends in fire protection symposium overview. *Wood and Fiber* 9(2):87-88. (FPL)  
Short, Paul H., George E. Woodson, and Dewayne E. Lyon.  
1978. Dry chips vs. green chips as furnished for medium-density fiberboard. *For. Prod. J.* 28(3):33-37. (SO)  
Simpson, William T., and John L. Tschernitz.  
1978. Does thickness variation in sawing affect kiln drying? *South. Lumberman.* 236(2929). (FPL)  
Simpson, William T.  
1977. Model for tensile strength of oriented flakeboard. *Wood Sci.* 10(2):68-71. (FPL)  
Snellgrove, Thomas A., and Thomas D. Fahey.  
1977. Market values and problems associated with utilization of dead timber. *For. Prod. J.* 27(10):74-79, illus. (PNW)  
Springer, E. L.  
1978. Losses during storage of southern pine chips—the case for stand-by storage. *Tappi* 61(5):69-72. (FPL)  
Stern, A., H. Hallock, and D. Lewis.  
1977. Effect of sawing accuracy on lumber yield. *In* Proc. IUFRO

## products and engineering

- Meet. Work. Party S.5.04.8. (FPL)
- Stern, A., H. Hallock, and D. Lewis.  
1978. Improving sawing accuracy does help. U.S. Dep. Agric. For. Serv. Pap. FPL 320. (FPL)
- Suddarth, S. K., W. L. Galligan, and H. M. Montrey.  
1977. A new look in engineering for light-frame buildings. *Constr. Specifier*, p. 49-51. December. (FPL)
- Suddarth, S. K., F. E. Woeste, and W. L. Galligan.  
1978. Differential reliability: probabilistic engineering applied to wood members in bending/tension. U.S. Dep. Agric. For. Serv. Res. Pap. FPL 302. (FPL)
- Taras, Michael A.  
1978. Biomass of southern pines and their product yields. *In* Complete-tree utilization of southern pines symposium proceedings, p 15-23. For. Prod. Res. Soc. (SE)
- Taras, Michael A., and D. R. Phillips.  
1978. Aboveground biomass of slash pine in a natural sawtimber stand in southern Alabama. U.S. Dep. Agric. For. Serv. Res. Pap. SE-188. 31 p. (SE)
- Tegethoff, A. C., T. E. Hinds, and W. E. Eslyn.  
1977. Beetle-killed lodgepole pines are suitable power-poles. *For. Prod. J.* 27(9):21-23. (RM)
- Tuomi, R. L., and W. J. McCutcheon.  
1978. Racking strength of light-framed nailed walls. *J. Str. Div. ASCE* ST 7:1131-1140. (FPL)
- Urbanik, T. J.  
1978. Transportation vibration effects on unitized corrugated containers. U.S. Dep. Agric. For. Serv. Res. Pap. FPL 322. (FPL)
- Wahlgren, H. E., Roland Barger, and Harold Marx.  
1977. Stretching our nation's timber supply—close timber utilization. U.S. Dep. Agric. For. Serv. Program Aid 1189, 9 p. (INT)
- Watts, Alva B., and Floyd G. Manwiller.  
1978. Evaluation of southern pine needles and twigs as a potential poultry feed supplement. *In* Complete-tree utilization of southern pine symposium proceedings, p. 309-312. For. Prod. Res. Soc. (SO)
- Weatherwax, R. C.  
1977. Collapse of cell-wall pores during drying of cellulose. *J. Colloid & Interface Sci.* 62(3):432-446. (FPL)
- Wenger, Eugene M.  
1977. A quick method to distinguish aspen heartwood and sapwood. *Wood and Fiber* 8(2):114-115. (FPL)
- Wilkinson, Thomas Lee.  
1978. Strength of bolted wood joints with various ratios of member thickness. U.S. Dep. Agric., For. Serv. Res. Pap. FPL-314. 8 p. (FPL)
- Wilkinson, Thomas Lee, E. A. Fuchs, and R. E. Rowlands.  
1978. Photomechanical determination of stresses in the neighborhood of loaded holes in anisotropic media. *In* Proc 6th Int. Conf. Exp. Stress Anal. (FPL)
- Wolfe, R. W., and R. C. Moody.  
1978. Bending strength of water-soaked glued laminated beams. U.S. Dep. Agric. For. Prod. Lab. Res. Pap. FPL-307. (FPL)
- Woodfin, Richard O., Jr.  
1978. Ponderosa pine lumber recovery—young growth in northern California. U.S. Dep. Agric. For. Serv. Res. Pap. PNW-237. 13 p., illus. (PNW)
- Woodson, George E.  
1977. Medium-density fiberboard from mixed southern hardwoods. *In* Proc. Wash. State Univ. Symp. on Particleboard 11:131-140. (SO)
- Woodson, George E., and Steve Rigby.  
1978. Heading chippers and surface quality—a review of the problem and possible solutions. *In* Complete-tree utilization of southern pine symposium proceedings, p. 335-344. For Prod. Res. Soc. (SO)
- Woodson, George E., and Steve Rigby.  
1978. Surface quality varies with heading chipping. *Ala. For.* 21(7): 28-34. (SO)
- Wroblewski, H., A. H. Conner, J. W. Rowe, and others.  
1978. Parquat-induced lightwood in two European conifers—Scotch pine and Norway spruce. *Wood Sci.* 10:181-186. (FPL)
- Youngquist, John A.  
1978. Production and marketing opportunities for parallel-laminated veneer products. *In* 1978 Portland plywood clinic proceedings, Mar. 9-10, 1978. Mod. Plywood Techn. Vol 6. (FPL)
- Youngquist, John A., F. Brey, and J. Jung.  
1977. Structural performance of electrical distribution crossarms. U.S. Dep. Agric. For. Serv. Res. Pap. FPL 303. (FPL)
- Youngquist, John A., F. Fronczak, D. Severf, and R. Youngs.  
1978. Further options for small-scale mills: supplement to small-scale mills for producing parallel-laminated products from veneer. *In* Proc. 8th World For. Congr. (FPL)
- Youngquist, John A., F. Fronczak, and R. Youngs.  
1978. Small-scale mills for producing parallel-laminated products from veneer. *In* Proc. 8th World For. Congr. (FPL)



- Youngquist, John A., and D. Gromala.  
1978. Press-Lam timbers for exposed structures. *In* Proc. Am. Soc. Chem. Eng. Conf. (FPL)
- Zavarin, E., Y. Wong, and D. F. Zinkel.  
1978. Lightwood as a source of unusual naval stores chemicals. *In* Proc. Lightwood Res. Coord. Counc. Meet., p. 19-30. (FPL)
- Zerbe, John I.  
1977. A conference on capturing the sun through bioconversion. *In* Proc. 1976 Wash. Cent. for Metrop. Stud. and U.S. Energy Res. Dev. Admin. p. 271-272.
- Zerbe, John I.  
1977. Conversion of stagnated timber stands to productive sites and use of noncommercial material for fuel. *In* Fuels and energy from renewable resources, p. 115-123. Academic Press, Inc. New York.
- Zerbe, John I.  
1977. Forest fuels, U.S.A. *In* Proc. For. Fuels Symp.
- Zerbe, John I.  
1978. The role of wood in the energy crisis. *For. Farmer*, July-August, p. 18-19, 34-35.
- Zerbe, John I.  
1977. Wood in the energy crisis. *For. Farmer*, Nov-Dec. p. 12-15.
- Zinkel, D. F., and C. R. McKibben.  
1978. Chemistry of naval stores from pine lightwood—a critical review, p. 133-156. *In* Proc. Lightwood Res. Coord. Counc. Meet. (FPL)

## RESOURCE ECONOMICS

### General

- Aitro, Vincent P., compiler.  
1977. Fifty years of forestry research: annotated bibliography of the Pacific Southwest Forest and Range Experiment Station, 1926-1975. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PSW-23. 250 p., illus. (PSW)
- Baugh, Tom, and Betty Bell.  
1978. Preparing manuscripts for proceedings and compendiums. U.S. Dep. Agric. For. Serv. Res. Note PNW-310, 10 p. (PNW)
- Callahan, Robert Z.  
1977. Knowledge utilization: what's it all about? *In* Proc. Ann. West.

- Int. For. Dis. Work Conf., p. 49-60. (PSW)
- Callahan, Robert Z., and Theodor B. Yerke.  
1977. An evaluation of PACFORNET (Pacific Coast Forest Research Information Network). 75 p. (PSW)
- Pacific Northwest Forest and Range Experiment Station.  
1977. The forester's almanac 1977. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PNW-62. 220 p., illus. (PNW)
- Pacific Northwest Forest and Range Experiment Station.  
1978. Annotated list of publications of the Pacific Northwest Forest and Range Experiment Station for the year 1977. 23 p. (PNW)
- Yerke, Theodor B.  
1978. PACFORNET: technical information services for Pacific Coast foresters. *J. For.* 76(2):89-92. (PSW)

### Impacts on Forest Industry and Regional Economics

- Ayer, Harry W., and James Baskett.  
1978. Elasticities: supplementary statistics from interindustry studies. *West J. Agric. Econ.* 1978:75-79. (RM)
- Bell, Enoch F.  
1977. Estimating effect of timber harvesting levels on employment in western United States. U.S. Dep. Agric. For. Serv. Res. Note INT-237. 11 p. (INT)
- Bond, Robert S.  
1975. A labor situation analysis of the Northeastern primary wood-processing industries. *In* Social sciences in forestry: a book of readings, p. 176-183. W. B. Saunders Co., Philadelphia. (NE)
- Bond, Robert S.  
1975. Labor research needs in the forestry economy of the United States. Yale Univ., Sch. For. and Environ. Studies Bull. 86:178-183. (NE)
- Bond, Robert S., and Charles H. Wolf.  
1978. Status and outlook of bonded Canadian woodworkers in Maine. *The North. Logger and Timber Process.* 26(11):6-7, 44, illus. (NE)
- Granskog, James E.  
1978. Economics of scale and trends in the size of southern forest industries. *In* Complete-tree utilization of southern pine proceedings, p. 81-90. *For. Prod. Res. Soc. (SO)*
- Granskog, James E., and William C. Siegel.  
1978. The legal distinction between employee and independent con-

- tractor as applied to collective bargaining activities in timber harvesting. *For. Prod. J.* 28(9):16-20. (SO)
- Holmlund, Jerome H., Harold E. Worth, and Lee B. Zink. 1978. The feasibility of a handcrafted wood furniture enterprise in northcentral New Mexico, p. 11-16. *N. Mex. Bus. (RM)*
- Kallio, Edwin, and William L. Galligan. 1978. Growing truss market benefits softwood lumber manufacturers. *For. Ind.* 105(7):92-93, 96. (FPL) (NC)
- Meyers, Cecil H., Edwin Kallio, and Philip L. Friest. 1977. Income generation in the primary forest industries of northeastern Minnesota. *Bur. Bus. and Econ. Res. Res. Study Number 17, Univ. Minn. (NC)*
- Worth, Harold E. 1977. Marketing wood for people. p. 338-343. *In Forests for people proceedings.* 361 p. *Proc. Soc. of Am. For. 1977 Natl. Meet. (RM)*

## Improved Marketing Systems

- Adams, Edward L., and Daniel E. Dunmire. 1977. SOLVE II: a technique to improve efficiency and solve problems in hardwood sawmills. *U.S. Dep. Agric. For. Serv. Res. Pap. NE-382.* 19 p. (NE)
- Anderson, Walter C., and George B. Harpole. 1978. Manufacture and marketing of lumber laminated from thick southern pine veneer. *In Complete-tree utilization of southern pine proceedings,* p. 401-405. *For. Prod. Res. Soc. (SO)*
- Baumgras, John E., and A. Jeff Martin. 1978. The weak link logging systems analyzer. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-40.* 63 p. (NE)
- Brodie, John E., and Jean Nolley. 1978. Maryland's primary wood industry: a utilization summary and directory. 47 p. (NE)
- Duthie, A. H., Suzanne Wulff, K. M. Nilson, and others. 1977. Flavor panel selects all-natural maple yogurt. *J. Cultured Dairy Prod. (NE)*
- Ellefson, Paul V., and Gilbert P. Dempsey. 1977. Promotion: a step toward sound Christmas tree marketing. *Colo. For. Prod. Mark. Bull.* 11(4):4-5. (NE)

- Galligan, William L., Edwin Kallio, and Isaac Sheppard. 1977. Lumber truss design—views of designers and regulatory agencies. *For. Prod. J.* 27(12):25-29. (FPL) (NC)
- Garrett, Lawrence D. 1977. Processing maple syrup with a vapor compression distiller: an economic analysis. *U.S. Dep. Agric. For. Serv. Res. Pap. NE-385 (NE)*
- Garrett, Lawrence D., Howard Duchacek, Mariafranca Morselli, and others. 1977. Increasing the efficiency of maple sap evaporators with heat exchangers. *U.S. Dep. Agric. For. Serv. Res. Pap. NE-388. (NE)*
- Garrett, Lawrence, and Thomas H. Pendleton. 1977. Developing models to forecast sales of natural Christmas trees. *U.S. Dep. Agric. For. Serv. Res. Pap. NE-374.* 5 p., illus. (NE)
- Goho, Curtis D. 1977. Logging a farm woodlot with the Farmi-winch. *N. Logger* 26(5): 14-15, 30-31. (NE)
- Hansen, Bruce G. 1977. Goals programming: a new tool for the Christmas tree industry. *U.S. Dep. Agric. For. Serv. Res. Pap. NE-378.* 4 p., illus. (NE)
- Hansen, Bruce G. 1978. A new tool: goal programming. *Am. Christmas Tree J.* 22(3): 42-44, illus. (NE)
- Hansen, Bruce G., and Charles J. Gatchell. 1978. Serpentine end matching: a test of visual perception. *U.S. Dep. Agric. For. Serv. Res. Pap. NE-408.* 5 p., illus. (NE)
- Harpole, G. B. 1978. A cash flow computer program to analyze investment opportunities in wood products manufacturing. *U.S. Dep. Agric. For. Serv. Res. Pap. FPL 305. (FPL)*
- Ince, P. J., and G. B. Harpole. 1977. PARVCOST: A particleboard variable cost program. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. FPL 14. (FPL)*
- Kallio, Edwin, and William L. Galligan. 1978. Factors affecting the use of lumber by truss fabricators in the United States. *For. Prod. J.* 28(3):15-18. (FPL) (NC)
- Martin, A. Jeff. 1977. Increased yields from near-complete multiproduct harvesting of a cove-hardwood stand. *N. Logger* 26(4):6-7, 37. (NE)
- McLain, Thomas E., and E. George Stern. 1978. Withdrawal resistance of pallet nails and staples in five western woods. *VPI&SU, Wood Res. & Wood Constr. Lab., Pallet & Container Res. Center, Bul. No.* 155. 12 p. (NE)

- Morrow, Susan B., Robert Clarke, and Paul E. Sendak.  
1977. How does it taste? *Natl. Maple Syrup Dig.* 16(3):11-13. (NE)  
Millner, James D.  
1977. Credit for maple producers. *Natl. Maple Syrup Dig.* 16(3):17-23. (NE)  
Nolley, Jean W.  
1978. Christmas trees: a bibliography. *Am. Christmas Tree J.* 22(1): 27-28. (NE)  
Sendak, Paul E.  
1978. Birch sap utilization in the Ukraine. *J. For.* 76(2):120-121. (NE)  
Sendak, Paul E.  
1978. Consumer preference for graded maple syrup. *U.S. Dep. Agric. For. Serv. Res. Pap.* NE-402. (NE)  
Sendak, Paul E., Mariafranca Morselli, and David E. Bee.  
1978. Storage of U.S. Grade AA maple syrup in the retail package. *J. Food Sci.* 43:1002-1005. (NE)  
Stern, E. George.  
1977. Performance of lumber pallets. *VPI&SU, Wood Res. & Wood Constr. Lab., Pallet & Container Res. Cent., Bull.* 154. 36 p. (NE)  
Stern, E. George.  
1978. Performance of warehouse and exchange pallets made of six western woods. *VPI&SU, Wood Res. & Wood Constr. Lab., Pallet & Container Res. Cent. Bull.* 156. 48 p. (NE)  
Wallin, Walter B.  
1978. Effect of deviations in pallet specifications on cost of use. *Natl. Wooden Pallet and Container Assoc. Eastern Pallet Users' Conf.* 35 p. (NE)

## Marketing Under-Used Species and Residues

- Carpenter, Eugene M.  
1977. Secondary wood residue: production, use, and potential in the Twin City area. *U.S. Dep. Agric. For. Serv. Res. Paper* NC-144. 6 p. (NC)  
Dickerhoof, H. Edward, and Thomas C. Marcin.  
1978. Factors influencing market potential for structural flakeboard. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep.* WO 5, p. 309. (FPL)  
Ellis, T. H.  
1978. Economic analysis of wood- or bark-fired systems. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep.* FPL 16. (FPL)

- Emanuel, David M.  
1978. Processing hardwood bark residues by screening. *U.S. Dep. Agric. For. Serv. Res. Note* NE-260. 3 p. (NE)  
Garrett, Lawrence D.  
1978. The economic feasibility of manufacturing structural flakeboard in Vermont. p. 172-178. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep.* WO 5. (NE)  
Garrett, Lawrence D.  
1978. The economic implications of using wood space heaters for home comfort heat. *In* Wood heating seminar 3 proceedings document, p. 390-415. *Contin. Educa. Program Wood Energy Inst.* (NE)  
Harpole, G. B.  
1978. Overview of production cost. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep.* WO 5. (FPL)  
Harpole, G. B.  
1978. Production opportunities in northern California. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep.* WO 5. (FPL)  
Harpole, G. B., W. F. Lehmann, M. O. Hunt, and others.  
1978. Feasibility of manufacturing structural flakeboard roof decking from dense hardwood in the United States. *In* Proc. IUFRO Meet. (FPL)  
Sarles, Raymond L., and David M. Emanuel.  
1977. Hardwood bark mulch for revegetation and erosion control on drastically disturbed sites. *J. Soil & Water Conserv.* 32(5):209-214. (NE)  
Vajda, Peter.  
1978. Plant facility considerations for structural flakeboard manufacture. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep.* WO 5. (FPL)

## Methods of Evaluation and Planning

- Adams, Darius M., Richard W. Haynes, and David R. Darr.  
1977. Alternative techniques for analysis of price effects of changes in National Forest timber flows: a background report. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep.* PNW-60. 18 p., illus. (PNW)  
Colbert, Terry S.  
1978. Distributing functions between maxi and mini computer. *In* Implementing computer systems in the field workshop proceedings. *Syst. Anal. Work. Group, Soc. Am. For. and Iowa State Univ.* (WO-FRER)

## resource economics

- Fight, Roger D., and Enoch F. Bell.  
1977. Coping with uncertainty—a conceptual approach for timber management planning. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PNW-59. 18 p., illus. (PNW)
- Martin, A. Jeff.  
1977. A computer program for analyzing PERT networks. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-32. 10 p. (NE)
- Massey, Joseph G., and Clyde A. Fasick.  
1978. A system to monitor and provide prompt feedback on conference results. Public Data Use 6(5):13-19. (WO-FRER)
- Robinson, V. L., A. A. Montgomery, and James D. Strange.  
1978. GASPLY: a computer model for Georgia's future forest. Ga. For. Res. Council, Res. Rep. 36A. 21 p. (SE)
- Steuer, Ralph E., and Albert T. Schuler.  
1978. An interactive multiple-objective linear programming approach to a problem in forest management. Operations Res. J. 26(2):254-269, illus. (NE)

## Multiple Use

- Brown, Thomas C., and D. Ross Carder.  
1977. Sustained yield, of what? J. For. 75(11):722-723. (RM)
- Calish, Steven, Roger D. Fight, and Dennis E. Teeguarden.  
1978. How do nontimber values affect Douglas-fir rotations? J. For. 76(4):217-221, illus. (PNW)
- Daniel, T. C.  
1977. Public perception based assessment of forest aesthetics. *In* Forests for people. Proc. Soc. Am. For. Natl. Meet. (RM)
- Gansner, David A., Owen W. Herrick, and William B. White.  
1978. Economic analysis of the gypsy moth problem in the northeast. Forest stand hazard ratings for gypsy moth. U.S. Dep. Agric. For. Serv. Res. Pap. NE-410. 3 p. (NE)
- Gratzner, Miklos A., James E. Sutherland, and Robert T. Throssell.  
1978. Recreation in the Poconos: images and perceptions. S.U.N.Y. Coll. of Environ. Sci. and For. 32 p. (Unnumbered Bull.)
- Sassaman, Robert W., and Robert M. Randall.  
1977. A method of evaluating impacts of timber harvests on nontimber forest resources. Trans. 42d North Am. Wildl. and Nat. Resour. Conf., p. 185-189. Wildl. Manage. Inst. (PNW)

- U.S. Department of Agriculture, Forest Service.  
1977. Outdoor recreation facilities in northeastern Pennsylvania 1976. (Unnumbered publ.) (NE)
- U.S. Department of Agriculture, Forest Service  
1977. Recreational use of anthracite waste land in northeastern Pennsylvania—suggestions for an evaluation and planning process. 112 p. (Unnumbered publ.) (NE)

## Supply, Demand, Price, and Trade Analyses

- Adams, Darius M., Richard W. Haynes, and David R. Darr.  
1977. A welfare analysis of long-term forest products price stabilization. Am. J. Agric. Econ. 59(4):662-673. (PNW)
- Dickerhoof, H. Edward.  
1978. Panel product usage in mobile home production in the top five producing states and in the United States. U.S. Dep. Agric. For. Serv. Res. Bull. FPL 3. 8 p. (FPL)
- Dickerhoof, H. Edward.  
1978. Use of wood in mobile homes is increasing. U.S. Dep. Agric. For. Serv. Res. Bull. FPL 4. 20 p. (FPL)
- Fight, Roger D., and Douglas J. YoungDay.  
1977. Public forest policy, wood prices, and the consumer. J. For. 75(11):703-706, illus. (PNW)
- Haynes, Richard W., D. Lester Holley, Jr., and Richard A. King.  
1978. A recursive spatial equilibrium model of the softwood timber sector. Sch. For. Resour., N.C. State Univ. Tech. Rep. 57. 71 p., illus. (PNW)
- Hutchins, C. C., Jr.  
1977. Pulpwood prices in the Southeast, 1976, and 5-year trend. U.S. Dep. Agric. For. Serv. Res. Note SE-253. 4 p. (SE)
- Lindell, Gary R.  
1978. Log export restrictions of the western States and British Columbia. U.S. Dep. Agric. Gen. Tech. Rep. PNW-63. 14 p., illus. (PNW)
- Lindell, Gary R.  
1978. Log export restrictions vary between western jurisdictions. For. Ind. 105(5):48-50, 76. (PNW)
- Marcin, Thomas C.  
1977. Outlook for housing by type of unit and region 1978-2020. U.S. Dep. Agric. For. Serv. Res. Pap. FPL 304. (FPL)
- Phelps, Robert B.  
1976. Outlook for timber products. *In* 1977 U.S. agricultural outlook.

- U.S. Dep. Agric. Natl. Agric. Outlook Conf. U.S. Senate, Comm. on Agric. and For., 94th Congr., 2d Sess. p. 301-308. (WO-FRER)
- Phelps, Robert B.  
1977. Hardwood timber product trends. *In* Research on insect borers of hardwoods: current status, needs and applications, p. 50-66. Proc. Res. Coord. Meet. (WO-FRER)
- Phelps, Robert B.  
1977. National and regional needs for increasing wood yields through intensive management. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-29, p. 17-24. (WO-FRER)
- Phelps, Robert B.  
1977. Outlook for timber products. *In* 1978 U.S. agricultural outlook. Food and Agric. Outlook Conf. U.S. Senate, Comm. on Agric., Nutr., and For., 95th Cong., 1st Sess., p. 290-297. (WO-FRER)
- Phelps, Robert B.  
1977. The demand and price situation for forest products 1976-77. U.S. Dep. Agric. For. Serv. Misc. Publ. 1357. 95 p., illus. (WO-FRER)
- Ruderman, Florence K.  
1977. Production, prices, employment, and trade in Northwest forest industries, first quarter 1977. 53 p., illus. (Unnumbered publ.) (PNW)
- Ruderman, Florence K.  
1977. Production, prices, employment, and trade in Northwest forest industries, second quarter 1977. 66 p., illus. (Unnumbered publ.) (PNW)
- Ruderman, Florence K.  
1978. Production, prices, employment, and trade in Northwest forest industries, third quarter 1977. 58 p., illus. (Unnumbered publ.) (PNW)
- Ruderman, Florence K.  
1978. Production, prices, employment, and trade in Northwest forest industries, fourth quarter 1977. 56 p., illus. (Unnumbered publ.) (PNW)
- Ruderman, Florence K.  
1978. Production, prices, employment, and trade in Northwest forest industries, first quarter 1978. 53 p., illus. (Unnumbered publ.) (PNW)
- Schuler, Albert T.  
1978. The insulation board industry—an econometric analysis. U.S. Dep. Agric. For. Serv. Res. Pap. NE-407. 8 p., illus. (NE)
- Spelter, Henry N., Robert N. Stone, and David B. McKeever.  
1978. Wood usage trends in the furniture and fixtures industry. U.S.

- Dep. Agric. For. Serv. Res. Note FPL-0239. (FPL)
- Stone, Robert N.  
1977. Are United States wood supplies dependable and adequate? *In* Proc. For. Prod. Res. Soc. Conf. on Energy Effic. in Wood Build. Constr. (FPL)
- Stone, Robert N.  
1978. Outlook for wood products requirements. *In* Proc. Mark. and Util. of Yellow Poplar Symp. (FPL)
- Stone, Robert N., and Jerome F. Saeman.  
1977. World demand and supply of timber products to the year 2000. For. Prod. J. 27(10):49-54. (FPL)
- Stone, Robert N., and H. Edward Dickerhoof.  
1978. Outlook for forest products trade and imports. For. Prod. J. 27(10):44-48. (FPL)
- Stone, Robert N., and Thomas C. Marcin.  
1978. Surveys for forest resource demand analysis, p. 6. *In* Proc. Soc. Am. For. Natl. Workshop on Integrated Inventories of Renewable Natural Resour. (FPL)

## Timber Growing

- Adams, Darius M., Richard W. Haynes, and David R. Darr.  
1977. Wood products consumers, producers, and National Forest timber flow policy. J. For. 75(10):648-649, 666. (PNW)
- Bell, Enoch F.  
1977. Declining harvest from linking allowable cut to the budget on National Forests. J. For. 75(11):701-702. (INT)
- Dutrow, G. F.  
1978. A study of economic management opportunities to increase timber supplies in Southeast United States: some preliminary and tentative results. FOREM. Spring. (SE)
- Godman, R. M., and J. J. Mendel.  
1978. Economic values for growth and grade changes of sugar maple in the Lake States. U.S. Dep. Agric. For. Serv. Res. Pap. NC-155, 16 p. (NC)
- Granskog, James E.  
1978. Harvesting costs for mechanized thinning systems in slash pine plantations. U.S. Dep. Agric. For. Serv. Res. Pap. SO-141. 7 p. (SO)
- Greene, John L.  
1977. Two publicly sponsored assistance programs using private consul-



tants. Consultant 22(3):56-59. (NE)

Herrick, Owen W.

1977. Impact of alternative timber management policies on availability of forest land in the northeast. U.S. Dep. Agric. For. Serv. Res. Pap. NE-390. p. 14. (NE)

Johnson, K. Norman, Enoch F. Bell, and Alfred F. Burkhardt, Jr.

1977. Rotation flexibility and allowable cut. J. For. 75(11):699-701. (INT)

Mendel, Joseph J., and Margaret K. Peirsol.

1977. Quality index tables for some eastern hardwood species. U.S. Dep. Agric. For. Serv. Res. Pap. NE-370. 10 p. (NE)

Randall, Robert M.

1977. Timber harvesting issues. In Making dollars and sense out of forestry, p. 310-323. Proc. Natl. Indian Timber Symp. (PNW)

Row, Clark.

1978. Economics of tract size in timber growing. J. For. 76(9):576-582. (WO-FRER)

Sassaman, Robert W., James W. Barrett, and Asa D. Twombly.

1977. Financial precommercial thinning guides for Northwest ponderosa pine stands. U.S. Dep. Agric. For. Serv. Res. Pap. PNW-226. 27 p., illus. (PNW)

Schweitzer, Dennis L., Gilbert P. Dempsey, and others.

1978. The federal role in the conservation and management of private nonindustrial forest lands. U.S. Dep. Agric. Interagency Comm. Rep. 63 p. (NE)

Sesco, Jerry A., and David C. Baumgartner.

1978. Eastern forests and economic considerations in "208" planning. In "208" symposium—nonpoint sources of pollution from forested land proceedings, p. 13-20. South. Ill. Univ. (NC)

Siegel, William C.

1977. An overview of forest property tax laws in the Western United States, p. 10-17. In Proc. West. Reg. For. Prop. Taxation Workshop. (SO)

Siegel, William C.

1977. Historical development of federal income tax treatment of timber. In Forest taxation symposium, p. 17-25. Va. Polytech. Inst. and State Univ. (SO)

## Inventory and Analysis Techniques

Aldrich, Robert C.

1978. A national multiresource inventory system: possibilities, problems, and progress. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55, p. 474-480. (RM)

Barnard, Joseph E.

1978. A tool for the processing of integrated resource inventory data. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55, p. 332-335. (NE)

Barnard, Joseph E.

1978. Example of a specific regional inventory: the United States northeastern double sampling with partial replacement design, p. 620-627. In Proc. IUFRO Subject Groups S4.02 and S4.04 "Natl. For. Inventory", Bucharest, Romania. (NE)

Barnard, Joseph E., and J. David Born.

1978. FINSYS-2: subsystem EDIT-2. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-43. 68 p. (NE)

Buchman, Roland G.

1978. Timely resource information through process modeling: the north central system experience. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55, p. 344-349. (NC)

Clendenen, Gary W.

1978. Pinyon and juniper inventory procedures. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-39. (INT)

Driscoll, R. S.

1978. Forest inventories for national assessments in the United States. In Proc. Int. Union For. Res. Organ. 1978:629-636. (RM)

Driscoll, Richard S.

1978. Land classification systems: moderator's comments. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55, p. 155-156. (RM)

Francis, Richard E.

1978. Current rangeland inventory methods—compatibility toward an ecological base? U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55, p. 91-103. (RM)

Hann, David W., and B. Bruce Bare.

1978. Comprehensive tree volume equations for major species of New Mexico and Arizona: I. results and methodology. U.S. Dep. Agric. For. Serv. Res. Pap. INT-209. 44 p. (INT)

Hann, David W., and B. Bruce Bare.  
1978. Comprehensive tree volume equations for major species of New Mexico and Arizona: II. tables for unforked trees. U.S. Dep. Agric. For. Serv. Res. Pap. INT-210. (INT)  
Howard, James O.  
1978. A technique for predicting logging residue volumes in the Douglas-fir region. U.S. Dep. Agric. For. Serv. Res. Pap. PNW-235. 14 p., illus. (PNW)  
Meeuwig, R. O., E. L. Miller, and J. D. Budy.  
1978. Estimating pinyon-juniper cordwood with the line-intersect method. U.S. Dep. Agric. For. Serv. Res. Note INT-242. 8 p. (INT)  
Van Sickle, Charles C.  
(1978.) An overview of regional forest inventory systems in the United States. In National forest inventory, p. 89-98. Proc. Jt. Meet. Intl. Union For. Res. Organ. Groups S4 02 and S4 04. (PNW)  
Ware, Kenneth D.  
1978. Principles for integrating inventories of renewable resources. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55, p. 260-266. (SE)  
Welch, R. L.  
1978. Predicting logging residues for the Southeast. U.S. Dep. Agric. For. Serv. Res. Note SE-263. 4 p. (SE)

## Resource Inventories

Barnard, Joseph E., and Teresa M. Bowers.  
1977. A preview of the forest resources of West Virginia. U.S. Dep. Agric. For. Serv. Res. Note NE-249. 11 p. (NE)  
Burde, John H., and David C. Baumgartner.  
1978. Availability of forest and associated land in Illinois. U.S. Dep. Agric. For. Serv. Res. Note NC-236. 4 p. (NC)  
Green, Alan W.  
1978. Timber resources of western South Dakota. U.S. Dep. Agric. For. Serv. Res. Bull. INT-12. 56 p. (INT)  
Kingsley, Neal P., and Douglas S. Powell.  
1978. The forest resources of Kentucky. U.S. Dep. Agric. For. Serv. Res. Bull. NE-54. 97 p. (NE)

Knight, H. A.  
1977. A preview of "Virginia's timber, 1977." U.S. Dep. Agric. For. Serv. Res. Note SE-252. 4 p. (SE)  
Knight, H. A.  
1977. The southern pine is losing ground. Ala. For. Prod. 20(9):4-6. (SE)  
Knight, H. A.  
1978. Average timber characteristics of the better stocked natural stands in North Carolina and eastern Virginia. U.S. Dep. Agric. For. Serv. Res. Note SE-257. 10 p. (SE)  
Knight, H. A., and Joe P. McClure.  
1978. Virginia's timber, 1977. U.S. Dep. Agric. For. Serv. Resour. Bull. SE-44. 53 p. (SE)  
Lothner, David C., Edwin Kallio, and David T. Davis.  
1978. Minnesota's tax-forfeited land: some trends in acreages, sales, and prices. U.S. Dep. Agric. For. Serv. Resour. Bull. NC-37. 6 p. (NC)  
Murphy, Paul A.  
1978. Mississippi forests: trends and outlook. U.S. Dep. Agric. For. Serv. Resour. Bull. SO-67. 32 p. (SO)  
Powell, Douglas S., and Teresa M. Bowers.  
1978. A preview of the forest resources of Maryland. U.S. Dep. Agric. For. Serv. Resour. Bull. NE-252. 7 p. (NE)  
Sheffield, R. M.  
1977. Forest statistics for the Southern Mountain Region of Virginia, 1977. U.S. Dep. Agric. For. Serv. Resour. Bull. SE-42. 33 p. (SE)  
Sheffield, R. M.  
1978. Coastal Virginia's timber resource—trends, present conditions, and opportunities for improvement. U.S. Dep. Agric. For. Serv. Resour. Bull. SE-43. 24 p. (SE)  
Snyder, N. L.  
1978. Forest statistics for the Piedmont of South Carolina, 1977. U.S. Dep. Agric. For. Serv. Resour. Bull. SE-45. 33 p. (SE)  
Sternitzke, Herbert S.  
1978. Coastal plain hardwood problem. J. For. 76(3):152-153. (SO)  
U.S. Department of Agriculture, Forest Service.  
1977. The nation's renewable resources—an assessment, 1975. U.S. Dep. Agric. For. Serv. Resour. Rep. No. 21. 243 p., illus. (WO-FRER)  
VanHooser, Dwane D., and Robert Sullivan.  
1978. Forest Statistics of the United States, 1977. U.S. Dep. Agric. For. Serv. 133 p. (WO-FRER)

# timber management

- Wall, Brian R.  
1978. Timber resources of the Sacramento area, California, 1972. U.S. Dep. Agric. For. Serv. Resour. Bull. PNW-73. 62 p., illus. (PNW)

## Utilization and Production

- Bertelson, Daniel F.  
1978. Mississippi forest industries—1976. U.S. Dep. Agric. For. Serv. Resour. Bull. SO-68. 25 p. (SO)  
Blyth, James E., and James T. Bones.  
1977. Veneer log production in the Northeast and North Central States in 1976. North. Logger and Timber Process. 26(5):10. (NC)  
Blyth, James E., and Jerold T. Hahn.  
1977. Pulpwood production in the North Central Region by county, 1975. U.S. Dep. Agric. For. Serv. Resour. Bull. NC-34. 22 p. (NC)  
Blyth, James E., and Jerold T. Hahn.  
1978. Pulpwood production in the North Central Region by county, 1976. U.S. Dep. Agric. For. Serv. Resour. Bull. NC-35. 22 p. (NC)  
Blyth, James E., and Jerold T. Hahn.  
1978. Veneer log production and receipts, North Central Region, 1976. U.S. Dep. Agric. For. Serv. Resour. Bull. NC-36. 17 p. (NC)  
Blyth, James E., and W. Brad Smith.  
1978. Pulpwood production in the Lake States by county, 1977. U.S. Dep. Agric. For. Serv. Res. Note NC-238. 4 p. (NC)  
Bones, James T., and David R. Dickson.  
1977. Pulpwood production in the Northeast — 1976. U.S. Dep. Agric. For. Serv. Resour. Bull. NE-53. 23 p. (NE)  
Bones, James T., and John E. Brodie.  
1977. The timber industries of Maryland. U.S. Dep. Agric. For. Serv. Resour. Bull. NE-52. 20 p. (NE)  
Bones, James T., and David R. Dickson.  
1978. Veneer, 1976 — a periodic assessment of regional timber output. U.S. Dep. Agric. For. Serv. Resour. Bull. NE-55. 13 p. (NE)  
Lloyd, J. D., Jr.  
1978. 1976 Oregon timber harvest. U.S. Dep. Agric. For. Serv. Resour. Bull. PNW-78. 2 p., illus. (PNW)  
Oswald, Daniel D.  
1978. Prospects for sawtimber output in California's North Coast. U.S. Dep. Agric. For. Serv. Resour. Bull. PNW-74. 20 p. (PNW)  
Welch, R. L., and T. R. Bellamy.  
1977. Changes in output of industrial timber products in Florida, 1969-

1975. U.S. Dep. Agric. For. Serv. Resour. Bull. SE-40. 23 p. (SE)

## TIMBER MANAGEMENT

### Biological Relationships

### Ecology

- Alban, David H.  
1978. The effects of timber harvesting on the soil chemical resource. *In* Forests for people—a challenge in world affairs, p. 238-243. Proc. Soc. Am. For. 1977. Natl. Conv. (NC)  
Bartos, Dale L.  
1978. Modeling plant succession in aspen ecosystems (Abstr.) p. 22. *In* 1st Intl. Rangeland Congr. (INT)  
Bjorkbom, John C., and Rodney Larson.  
1977. The Tionesta scenic and natural area. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-31. 24 p. (NE)  
Boldt, Charles E.  
1978. Stand management in endangered prairie woodlands. *In* Executive summaries proceedings, 1977 West. For. Conf. (RM)  
Boldt, Charles E., and Philip B. Johnson.  
1978. The Black Hills experimental forest: a self-guided tour. (Unnumbered publ.) (RM)  
Brown, David E., Charles H. Lowe, and Charles P. Pase.  
1977. Biotic communities of the Southwest. (Map) U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-41. (RM)  
Byer, Michael D., and Peter L. Weaver.  
1977. Early secondary succession in an elfin woodland in the Luquillo Mountains of Puerto Rico. Biotropica 9(1):35-47. (SO)  
Cotrufo, Cosimo.  
1977. Nutrient content in litterfall of an Appalachian hardwood stand. J. Elisha Mitchell Sci. Soc. 93(1):27-33. (SE)  
Della-Bianca, Lino, and Donald E. Beck.  
1977. Yellow-poplar recovers quickly from glaze damage. South. Lumberman 235(2920):55-56. (SE)

- Dindal, D. L., and L. J. Metz.  
1977. Community structure of *Collembole* affected by fire frequency. In *The role of arthropods in forest ecosystems*, p. 88-95. Springer-Verlag, New York. (SE)
- Eyre, F. H., and Don Minore.  
1977. Revising "Forest cover types of North America"—plans and progress. In *Ecological classification of forest land in Canada and Northwestern U.S.A.*, p. 365-373. Can. Inst. For., and Univ. B.C. (PNW)
- Ffolliott, Peter F., and Malchus B. Baker, Jr.  
1977. Characteristics of Arizona ponderosa pine stands on sandstone soils. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-44, 6 p. (RM)
- Franklin, Jerry F.  
1977. Ecological site classification activities in Oregon and Washington. In *Ecological classification of forest land in Canada and Northwest U.S.A.*, p. 321-328. Can. Inst. For., and Univ. B.C. (PNW)
- Gordon, Donald T.  
1978. California red fir literature: some corrections and comments. For. Sci. 24(2):52-56. (PSW)
- Harvey, A. E., M. F. Jurgensen, and M. J. Larsen.  
1978. Effects of timber harvesting on soil biology, p. 244-250. In *Proc. SAF 1978 Natl. Meet.* (INT)
- Harvey, A. E., M. F. Jurgensen, and M. J. Larsen.  
1978. Seasonal distribution of ectomycorrhizae in a mature Douglas-fir/larch forest soil in western Montana. For. Sci. 24(2):203-208. (INT)
- Heavilin, Danny G.  
1978. Response of *Eucalyptus* species to frost damage at the Redwood Experimental Forest. U.S. Dep. Agric. For. Serv. Res. Note PSW-331, 5 p. (PSW)
- Jordan, James S.  
1977. Deer populations of the Allegheny National Forest, 1974-1977. A seminar on the problem of deer and forest regeneration, p. 40. Plateau and North. Hardwood Ch., Soc. Am. For. (NE)
- Leak, W. B.  
1977. Relationship of species and site index to habitat in the White Mountains of New Hampshire. U.S. Dep. Agric. For. Serv. Res. Pap. NE-397, 9 p. (NE)
- Leak, W. B.  
1978. Relationship of forest vegetation to habitat on two types of glacial drift in New Hampshire. U.S. Dep. Agric. For. Serv. Res. Note NE-257, 5 p. (NE)
- Lee, Lyndon C., Robert D. Pfister, and Katherine B. Mark.  
1978. A training manual for Montana forest habitat types. Mont. For. and Conserv. Exp. Stn. Sch. For. Univ. Mont. 142 p., illus. (INT)
- Little, Elbert L., Jr.  
1977. Rare and local trees in the national forests. U.S. Dep. Agric. For. Serv., Conserv. Res. Rep. No. 21, 14 p.
- Little, Elbert L., Jr.  
1976. Rare tropical trees of south Florida. U.S. Dep. Agric. For. Serv., Conserv. Res. Rep. No. 20, 20 p., illus.
- Little, Elbert L., Jr.  
1978. Important forest trees of the United States U.S. Dep. Agric. For. Serv., Agric. Handb. No. 519, 70 p., illus.
- Little, Elbert L., Jr.  
1976. Trees and shrubs of the United States, a bibliography for identification. U.S. Dep. Agric. For. Serv. Misc. Publ. No. 1336.
- Little, Elbert L., Jr.  
1976. Atlas of United States trees. Volume 3, minor western hardwoods. U.S. Dep. Agric. For. Serv. Misc. Publ. 1314, 13 p., 290 maps.
- Little, Elbert L., Jr.  
1976. Atlas of United States trees. Volume 4, minor eastern hardwoods. U.S. Dep. Agric. For. Serv. Misc. Publ. 1342, 17 p., 230 maps.
- Little, Elbert L., Jr.  
1978. Atlas of United States trees. Volume 5, Florida. U.S. Dep. Agric. For. Serv. Misc. Publ. No. 1361, 22 p., 268 maps.
- McKee, Arthur, Richard H. Waring, and Jerry F. Franklin.  
1978. Past and future research on the Andrews Experimental Ecological Reserve (Abstr.) Ecol. Soc. Am. Bull. 59(2):104. (PNW)
- Marquis, David A.  
1977. Impact of deer on Allegheny hardwood regeneration. In *A seminar on the problem of deer and forest regeneration*, p. 28. Plateau and North. Hardwood Ch., Soc. Am. For. (NE)
- Martin, C. Wayne.  
1977. Distribution of tree species in an undisturbed northern hardwood-spruce-fir forest. U.S. Dep. Agric. For. Serv. Res. Note NE-244, 6 p. (NE)
- McDonald, Philip M.  
1977. Tanoak . . . a bibliography for a promising species. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PSW-22, 8 p. (PSW)

- McGee, Charles E.  
1978. The Cumberland Plateau—a sleeping giant. South. Lumberman 236(2929):13-14. (SO)
- Metz, L. J., R. A. Norton, and R. M. Reeves.  
1977. Soil biology bibliography of A. P. Jacot and arthropod taxa and new names he proposed. *In* Biology of oribatid mites, p. 1-32. Coll. Environ. Sci. and For. (SE)
- Miller, D. R.  
1977. UCONN studies of plant-atmosphere relationships may lead to improved land use in Connecticut. Conn. Res. 47. (NE)
- Neiland, Bonita J., and Leslie A. Viereck.  
1977. Forest types and ecosystems. *In* North American forest lands at latitudes north of 60 degrees, p. 109-136, illus. Proc. Symp. Univ. Alaska. (PNW)
- Norton, R. A., L. J. Metz, and G. D. Sharma.  
1978. Observations on *Epilomannoides* Jacot, 1936 (Acarina:Oribatei), with the description of a new species. J. Ga. Entomol. Soc. 13:134-148. (SE)
- Norton, R. A., L. J. Metz, and G. D. Sharma.  
1978. Some *Lohmanniidae* (Acarina:Oribatei) from North and South Carolina forest soils. J. Ga. Entomol. Soc. 13:15-24. (SE)
- Pfister, Robert D.  
1977. Ecological classification of forest land in Idaho and Montana. *In* Ecological classification of forest land in Canada and Northwestern USA proceedings, p. 329-358. Univ. British Columbia, Vancouver, Canada. (INT)
- Robuck, O. Wayne.  
1977. The common plants of the hemlock-spruce forests of Alaska. 67 p., illus. (Unnumbered publ.) (PNW)
- Shiffley, Stephen R., and Kenneth M. Brown.  
1978. Elm-ash-cottonwood forest type bibliography. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-42. 56 p. (NC)
- Tubbs, C. H.  
1977. Root-crown relations of young sugar maple and yellow birch. U.S. Dep. Agric. For. Serv. Res. Note NC-225. 4 p. (NC)
- Whitmore, Jacob L.  
1977. Classification of ecosystems in land management planning. p. 299-303. *In* Proc. Soc. Am. For. Annu. Conv. (SO)
- Whitmore, Jacob L., compiler.  
1978. Bibliography on *Eucalyptus deglupta* Bl. U.S. Dep. Agric. For. Serv. Res. Note ITF-17. 18 p. (SO)

- Wiberg, Curt, and Arthur McKee.  
1978. Boston Glacier research natural area, supplement no. 6. Pac. Northwest For. and Range Exp. Stn. 14 p., illus. (PNW)
- Zasada, John C., Keith Van Cleave, Richard A. Werner, and others.  
1977. Forest biology and management in high-latitude North American forests. *In* North American forest lands at latitudes north of 60 degrees, p. 137-195, illus. Proc. Symp. Univ. Alaska. (PNW)

## Physiology

- Adams, J. A., F. T. Bingham, M. R. Kaufmann, and others.  
1978. Responses of stomata and water, osmotic, and turgor potentials of Jojoba to water and salt stress. J. Agric. 70:381-387. (RM)
- Baker, James B.  
1977. Tolerance of planted hardwoods to spring flooding. South. J. Appl. For. 1(3):23-25. (SO)
- Boyer, William D.  
1978. Heat accumulation: an easy way to anticipate the flowering of southern pines. J. For. 76:20-23. (SO)
- Cecich, R. A.  
1978. Vacuole development and lipid synthesis in jack pine apical meristems. Bot. Soc. Am., Misc. Publ. 156:95. (NC)
- Dickson, Richard E.  
1978. Diurnal changes in cottonwood leaf chemical constituents and  $^{14}\text{CO}_2$  incorporation into specific compounds. (Abstr.) Plant Physiol. 61(4) Suppl.:71. (NC)
- Gorska-Brylask, A., E. Galoch, and Z. Porazinski.  
1976. The dynamics of endogenous growth regulators during the development of male cones of *Larix europaea* L. Acta Univ. Nicolai Copernici, Biol. SVIII, Nauki Math.-Przyr. 37:33-38. (NE)
- Hackaylo, E.  
1978. Response of pine roots to growth substances. *In* Proc. Physiol. and Symbiosis Conf. Nancy, France. 11 p. (NE)
- Haissig, B. E.  
1978. Influence of phenyl indole-3-acetate on adventitious root primordium initiation and development. Plant Physiol. (Suppl.) 61:65. (NC)
- Haissig, B. E., and K. E. Clausen.  
1977. Assembling safe, suitable incandescent lamp fixtures. Am. Nurseryman 146(9): 10, 69, 70, 71. (NC)



- Haissig, B. E., and A. L. Schipper, Jr.  
1978. How to extract and characterize dehydrogenases from woody plants. U. S. Dep. Agric. For. Serv. Res. Pap. NC-159. 15p. (NC)
- Horsley, Stephen B.  
1977. Allelopathic interference among plants II. physiological modes of action. In Proc. 4th North Am. For. Biol. Workshop, State Univ. N. Y. Coll. Environ. Sci. and For. (NE)
- Hoyle, M. C.  
1978. Illustrated handbook for high resolution of IAA oxidase-peroxidase isoenzymes by isoelectric focusing in polyacrylamide gel. U. S. Dep. Agric. For. Serv. Gen. Tech. Rep. NE-37. 26 p. (NE)
- Hoyle, M. C.  
1978. Optimum conditions for indoleacetic acid oxidase extraction from *Betula* leaves. Plant Physiol. 42(3):315-320. (NE)
- Hoyle, M. C.  
1977. High resolution of peroxidase-indoleacetic acid oxidase isoenzymes from horseradish by isoelectric focusing. Plant Physiol. 60(5): 787-793. (NE)
- Isebrands, J. G., and Philip R. Larson.  
1977. Vascular anatomy of the nodal region in eastern cottonwood. Am. J. Bot. 64:1066-1077. (NC)
- Janerette, C. A.  
1978. An in vitro study of seed dormancy in sugar maple. For. Sci. 24: 43-49. (NE)
- Kaufmann, Merrill R.  
1977. Soil temperature and drought effects on growth of monterey pine. For. Sci. 23:317-325. (RN)
- Kaufmann, Merrill R.  
1977. Soil temperatures and drying cycle effects on water relations of *Pinus radiata*. Can. J. Bot. 55:2413-2418. (RM)
- Kopcewicz, J., and Z. Porazinski.  
1976. Effect of blue light irradiation on metabolism of free and bound gibberellins in Scots pine (*Pinus silvestris* L.). Acta Univ. Nicolai Copernici, Biol. XVIII, Nauki Math.-Przyr. 37: 203-207. (NE)
- Kopcewicz, J., Z. Zatorska, H. Kulikowska, and T. Szczesniek.  
1977. Endogenous growth regulators in embryonic shoots of Scots pine at the time of male and female flower primordia initiation. Acta Societatis Botanicorum Poloniae 56:119-128. (NE)
- Krawczynsyn, J.  
1977. The transition from nonstoried to storied cambium in *Fraxinus excelsior*. I. The occurrence of radial anticlinal divisions. Can. J.
- Bot. 55:3034-3041. (NE)
- Krawczynsyn, J.  
1977. Cambial domain pattern in the root and root collar of *Platanus*. Acta Societatis Botanicorum Poloniae 46:531-541. (NE)
- Larson, Philip R.  
1978. Histogenesis of the leaf basal meristem in *Populus deltoides*. (Abstr.) Bot. Soc. Am. Misc. Publ. 156:88. (NC)
- Larson, Philip R.  
1977. Vascular bundles. In McGraw-Hill 1977 Yearb. Sci and Tech., p. 416-417. (NC)
- Larson, Philip R., and J. G. Isebrands.  
1978. Functional significance of the nodal constricted zone in *Populus deltoides*. Can. J. Bot. 56:801-804. (NC)
- Nelson, N. D.  
1978. Xylem ethylene, phenol-oxidizing enzymes, and nitrogen and heartwood formation in walnut and cherry. Can. J. Bot. 56:626-634. (NC)
- Nelson, N. D., J. G. Isebrands, and W. E. Hillis.  
1978. Some effects of ethylene on the morphology and anatomy of *Eucalyptus* and *Populus* seedlings (Abstr.) p. 34. Bot. Sci. Am. Misc. Publ. 156. (NC)
- Owston, Peyton W., and T. T. Kozlowski.  
1976. Effects of temperature and photoperiod on growth of western hemlock. In Proc. West. Hemlock Conf., p. 108-117, illus. Coll. For. Resour. Univ. Wash. (PNW)
- Priester, David S., and M. T. Pennington.  
1978. Inhibitory effects of broomsedge (*Andropogon virginicus* L.) extracts on the growth of young loblolly pine (*Pinus taeda* L.) seedlings. U.S. Dep. Agric. For. Serv. Res. Pap. SE-182. 7 p. (SE)
- Pyszynski, W.  
1977. Mechanism of formation of spiral grain in *Aesculus* stems: Disymmetry of deformation of stems caused by cyclic torsion. Acta Societatis Botanicorum Poloniae 46:501-522. (NE)
- Pyszynski, W.  
1977. Complex wavy grain in the stem of *Aesculus*. Acta Societatis Botanicorum Poloniae 46:231-249. (NE)
- Radwan, M. A., and D. S. DeBell.  
1977. Growth and foliar nitrogen and chlorophyll contents of western hemlock in relation to site index. (Abstr.) Agron. Abstr., p. 183. Am. Soc. Agron. (PNW)
- Radwan, M. A., and D. S. DeBell.  
1978. Relationships between site index, growth, and foliar chemical

- composition of western hemlock (Abstr.) p. 35. Northwest Sci. Assoc. 51st Annu. Meet. (PNW)
  - Romberger, J. A.
    1978. Beltsville symposia in agricultural research. 2. biosystematics in agriculture. Allanheld, Osmun & Co. and John Wiley & Sons, N.J. and N.Y. 340 p. (NE)
  - Shepperd, Wayne D.
    1977. Variation in growth of Engelmann spruce seedlings under selected temperature environment. (Abstr.). In Western forest genetics association Annual Meeting. Colo. State Univ. (RM)
  - Strong, T. F., and J. Zavitskovi.
    1978. Morphology of jack pine and tamarack needles. U.S. Dep. Agric. For. Serv. Res. Pap. NC-153, 6 p. (NC)
  - Venator, Charles R., Charles D. Howes, and Lehel Telek.
    1977. Chlorophyll and carotenoid contents of *Pinus caribaea* seedlings and inferences for adaptability. Turrialba 27(2):169-173. (SO)
  - Vozzo, John A.
    1978. Radiographic terminology for biological research. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. SO-18. 45 p. (SO)
- ## Genetics and Tree Improvement
- Bishir, John, and William D. Pepper.
    1977. Estimation of number of embryonic lethal alleles in conifers: I. Self-pollinated seed. Silvae Genet. 26(1):50-54. (SO)
  - Bramlett, D. L., E. W. Belcher, Jr., G. L. DeBarr, and others.
    1978. Cone analysis of southern pines—a guidebook. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. SE-13. 28 p. (SE)
  - Bramlett, David L., William G. Lewis, and Gary L. DeBarr.
    1977. Screen cages to protect control-pollinated pine cones from seedbugs. Tree Planters' Notes 28:25-28. (SE)
  - Brotschol, J. V., L. Nunnally, G. Namkoong, and H. A. Thomas.
    1977. Studies on enzyme variation in the southern pine beetle. Elisha Mitchell Sci. Soc. 93(2):91. (SE)
  - Campbell, R. K., and F. C. Sorensen.
    1978. Effect of test environment on expression of cines and on delimitation of seed zones in Douglas-fir. Theor. Appl. Genet. 51:233-246, illus. (PNW)
  - Conkle, M. Thompson, and W. T. Adams.
    1977. Use of isozyme techniques in forest genetics research. In Proc. South. For. Tree Improv. Conf. 14:219-226. (SE)
  - Cooper, Donald T., and Robert B. Ferguson.
    1977. Removal of competition bias from forest genetics experiments. In Proc. South. For. Tree Improv. Conf. 14:70-77. (SO)
  - Cooper, Donald T., Ted H. Filer, Jr., and Osborn O. Wells.
    1977. Geographic variation in disease susceptibility of American sycamore. South J. Appl. For. 1(4):21-24. (SO)
  - Copes, Donald L.
    1978. Isoenzyme activities differ in compatible and incompatible Douglas-fir graft unions. For. Sci. 24(2):297-303, illus. (PNW)
  - Copes, Donald L.
    1977. Influence of rooting media on root structure and rooting percentage of Douglas-fir cuttings. Silvae Genet. 26(2-3):102-106, illus. (PNW)
  - Copes, Donald L., and Roy C. Beckwith.
    1977. Isoenzyme identification of *Picea glauca*, *P. sitchensis*, and *P. lutzi* population. Bot. Gaz. 138(4):512-521, illus. (PNW)
  - Critchfield, William B.
    1977. Hybridization of foxtail and bristle-cone pines. Madrono 24:193-212. (PSW)
  - Dhillon, S. S., G. P. Berlyn, and J. P. Miske.
    1978. Nuclear DNA content in populations of *Pinus rigida*. Am. J. Bot. 65:192-196. (NC)
  - Ferguson, Robert B., and Donald T. Cooper.
    1977. Sweetgum variation changes with time. In Proc. South. For. Tree Improv. Conf. 14:194-200. (SO)
  - Gabriel, W. J.
    1978. Genetic variation in seed and fruit characters in sugar maple. U.S. Dep. Agric. For. Serv. Res. Pap. NE-404. (NE)
  - Garrett, P. W., and A. L. Shigo.
    1978. Selecting trees for their response to wounding. In Proc. Metro. Tree Improv. Alliance (METRIA) 1:69-72. (NE)
  - Garrett, P. W.
    1978. Eastern white pine selection and breeding. Penn. Christmas Tree Growers' Assoc. Bull. No. 140:16-17. (NE)
  - Grigsby, Hoy C.
    1977. A 16-year provenance test of loblolly pine in southern Arkansas. In Proc. South. For. Tree Improv. Conf. 14:261-268. (SO)
  - Hale, Kathy N., and David S. Canavera.
    1977. Preliminary results of a white spruce (*Picea glauca* (Moench)

- Voss) half-sib progeny test in Maine. *In* Proc Northeast. For. Tree Improv. Conf. 25:94-103. (NE)
- Jenkinson, James L.  
1977. Edaphic interactions in first-year growth of California ponderosa pine. U.S. Dep. Agric. For. Serv. Res. Pap. PSW-127. 16 p., illus. (PSW)
- Johnson, LeRoy, and Jean Johnson.  
1978. Methuselah, a fertile senior citizen. *Am. For.* 84(9):29-31, 43, illus. (PSW)
- Kormanik, P. P., W. C. Bryan, and R. C. Schultz.  
1977. Influence of endomycorrhizae on growth of sweetgum seedlings from eight mother trees. *For. Sci.* 23:500-506. (SE)
- Little, S., and I. F. Trew.  
1977. Progress report on testing pitch x loblolly pine hybrids and producing hybrid seed for mass plantings. *In* Northeast For. Tree Improv. Conf. Proc. 24:14-28. (NE)
- McLemore, Bobbie F.  
1977. Clone influences maturation of unpollinated strobili in southern pines. *Silvae Genet.* 26(4):134-135. (SO)
- Marquis, David A.  
1978. A role of tree improvement in the northeast: a silviculturist's point of view. *In* Northeast. For. Tree Improv. Conf. Proc. 25:48-57. (NE)
- Miksche, Jerome P., and Yasuo Hotta.  
1977. The application of DNA reassociation kinetics to evaluate *Picea* crossability patterns. *Silvae Genet.* 26(2-3):90-95. (NC)
- Namkoong, G.  
1977. A multiple index selection strategy. *Silvae Genet.* 25:199-200. (SE)
- Namkoong, G., and Stanley L. Krugman.  
1978. Third world consultation on forest tree breeding. *J. For.* 71:50-51. (SE)
- Perry David A., and James E. Lotan.  
1978. Variation in lodgepole pine (*Pinus contorta* var. *latifolia*): greenhouse response of wind pollinated families from five populations to day length and temperature-soil. *Can. J. For. Res.* 8(1):81-89. (INT)
- Radwan, Mohamed A.  
1977. Chlorogenic acid content and level and composition of essential oils in foliage of different Douglas-fir genotypes. (Abstr.) *Bot. Soc. Am. Misc. Publ.* 154, p. 51-52. (PNW)
- Randall, William K.  
1977. Short note: growth correlations of cottonwood clones developed from mature wood cuttings. *Silvae Genet.* 26:119-120. (SO)
- Randall, William K., and Bobby G. Blackmon.  
1977. Evaluation of clone-nitrogen interactions in *Populus deltoides*. *In* Proc. South. For. Tree Improv. Conf. 14:294-298. (SO)
- Read, Ralph A.  
1977. Tree improvement in the Great Plains, p. 22-28. *In* Proc. Intermt. Nurseryman's Assoc. 223 p. (RM)
- Rehfeldt, G. E.  
1978. Terpenes for indirect selection of growth potential in Rocky Mountain Douglas-fir. U.S. Dep. Agric. For. Serv. Res. Note INT-244. 8 p. (INT)
- Schmidtling, Ronald C.  
1977. Movement of shortleaf pine seed orchards south may greatly increase flowering. *In* Proc. South. For. Tree Improv. Conf. 14:138-143. (SO)
- Shigo, Alex L., Walter C. Shortle, and Peter W. Garrett.  
1977. Genetic control suggested in compartmentalization of discolored wood associated with tree wounds. *For. Sci.* 23(2):179-182. (NE)
- Silen, Roy R., and Edward J. Dimock, II.  
1978. Modeling feeding preferences by hare and deer among Douglas-fir genotypes. *For. Sci.* 24(2):57-64, illus. (PNW)
- Sluder, Earl R.  
1977. Easier pollination of half-diallel crosses by ranking flower phenology. *South. J. Appl. For.* 1(4):16. (SE)
- Snyder, E. Bayne, and Gene Namkoong.  
1978. Inheritance in longleaf pine: a diallel crossing experiment. U.S. Dep. Agric. For. Serv. Res. Pap. SO-140. 31 p. (SO)
- Sorensen, Frank C., and Jerry F. Franklin.  
1977. Influence of year of cone collection on seed weight and cotyledon number in *Abies procera*. *Silvae Genet.* 26(1):41-43. (PNW)
- Squillace, A. E.  
1977. Monoterpene composition of cortical oleoresin in *Pinus elliotii* and its utility in genetics research, p. 39-53. *In* EEC Symp. For. Tree Biochem. Brussels. (SE)
- Squillace, A. E.  
1977. Use of monoterpene composition in forest genetics research with slash pine. *Proc. South. For. Tree Improv. Conf.* 14:227-238. (SE)
- Squillace, A. E., R. J. Dinus, C. A. Hollis, and R. A. Schmidt.  
1978. Relation of oak abundance, seed source and temperature to geographic patterns of fusiform rust incidence. U.S. Dep. Agric. For.

- Serv. Res. Pap. SE-186. 20 p. (SE)
- Squillace, A. E., and L. P. Wilhite.  
1977. Influence of oak abundance and distribution on fusiform rust.  
*In* Management of fusiform rust in southern pines. Symp. Proc. Univ. Fla. 163 p. (SE)
- Van Deusen, James L., and Hans Nienstaedt.  
1978. A trial of eleven sources of *Picea abies* in North Dakota and Minnesota. *In* Proc. N. Dak. Acad. Sci. Annu. 31:32-39. (NC)
- Wells, Osborn O.  
1978. Performance of species-reciprocal hybrids between slash and shortleaf pines. U.S. Dep. Agric. For. Serv. Res. Note SO-235. 3 p. (SO)
- Wells, Osborn O., Paul E. Barnett, Harold J. Derr, and others.  
1978. Shortleaf x slash pine hybrids outperform parents in parts of the Southeast. South. J. Appl. For. 2:28-32. (SO)
- Wells, Osborn O., Warren L. Nance, and Bart A. Thielges.  
1977. Variation in needle traits in provenance tests of *Pinus taeda* and *P. echinata*. Silvae Genet. 26:125-130. (SO)
- Whitmore, Jacob L.  
1978. *Cedrela* provenance trial in Puerto Rico and St. Croix: establishment phase. U.S. Dep. Agric. For. Serv. Res. Note TTF-16. 11 p. (SO)
- Wilkinson, R. C.  
1978. Height growth performance of white spruce (*Picea glauca* (Moench) Voss) provenances in central Maine. *In* Proc. Northeast. For. Tree Improv. Conf. 25:87-93. (NE)
- Wilkinson, Ronald C.  
1977. Inheritance of budbreak and correlation with early height growth in white spruce (*Picea glauca*) from New England. U.S. Dep. Agric. For. Serv. Res. Pap. NE-391. 5 p. (NE)

## Management and Mensuration

### Management

- Amidon, Elliot L.  
1978. Computer mapping systems for integrated resource inventories. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55, p. 354-359.

- (PSW)
- Bauer, Edmund O., and Werner F. Bigalke.  
1978. Three tools for measuring height growth in field plantings compared. U.S. Dep. Agric. For. Serv. Res. Note NC-234. 2 p. (NC)
- Bruce, David.  
1977. Say goodbye to the board foot. J. For. 75(9):623. (PNW)

- Croft, Frank C., and Robert C. Heller.  
1978. How to estimate tree mortality on large scale color aerial photographs. Coll. For., Wildl. and Range Sci., Univ. Idaho. 29 p. (INT)
- Crow, Thomas R.  
1978. Common regressions to estimate tree biomass in tropical stands. For. Sci. 24:110-114. (SO)
- Edminster, Carleton B., James R. Getter, and Donna R. Story.  
1977. Past diameters and gross volumes of plains cottonwood in eastern Colorado. U.S. Dep. Agric. For. Serv. Res. Note RM-351. 4 p. (RM)
- Hamilton, David A., Jr.  
1978. Specifying precision in natural resource inventories. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-55, p. 276-281. (INT)
- Hazard, John W.  
1977. Estimating area in sampling forest populations on two successive occasions. For. Sci. 23(2):253-267. (PNW)
- Kinerson, R. S., and I. Bartholomew.  
1977. Biomass estimation equations and nutrient composition of white pine, white birch, red maple, and red oak in New Hampshire. U.S. Dep. Agric. For. Serv. Res. Pap. 62. 8 p. (NE)
- Lloyd, F. Thomas.  
1978. Choices of variables for correlation analysis when measurement error is present. p. 292-295. *In* Proc. Soil Moisture-Site Prod. Symp. (SE)
- Lloyd, F. Thomas, and William L. Hailey.  
1977. Precision and the probability of misclassification in site index estimation. For. Sci. 23(4):493-499. (SE)
- Meskimen, George, and E. C. Franklin.  
1977. Spacing *Eucalyptus grandis* in southern Florida, a question of merchantable versus total volume. South. J. Appl. For. 1:3-5. (SE)
- Rogers, Robert R., and Ernest Hilderbrand.  
1978. A SAS macro for calculating coefficients of ridge regression, p. 248-254. *In* 3d Annu. Stat. Anal. System User's Group Int. Conf. Proc. (NC)

## Management Planning

- Alexander, Robert R., and Carleton B. Edminster.  
1978. Regulation and control under uneven-aged management. *In* Uneven-aged silviculture and management in the United States, p. 217-230. U.S. Dep. Agric. For. Serv., Timber Manage. Washington, D.C. (RM)
- Amidon, Elliot L., and E. Joyce Dye.  
1978. Simulating forest pictures by impact printers. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PSW-25, 11 p., illus. (PSW)
- Biesterfeldt, Robert C., and Stephen G. Boyce.  
1978. Systematic approach to multiple-use management. *J. For.* 76(6): 342-345. (SE)
- Boyce, Stephen G.  
1977. Management of eastern hardwood forests for multiple benefits (DYNAST-MB). U.S. Dep. Agric. For. Serv. Res. Pap. SE-168, 116 p. (SE)
- Boyce, Stephen G.  
1978. Management of forests for timber and related benefits (DYNAST-TM). U.S. Dep. Agric. For. Serv. Res. Pap. SE-184, 140 p. (SE)
- Boyce, Stephen G.  
1978. Multiple benefits from forests: a solution to a most puzzling problem. *In* Growth models for long term forecasting of timber yields, p. 40-52. Proc. Int. Union For. Res. Organ., Div. 4, Subj. Group 1, Va. Polytech. Inst. and State Univ. Publ. FWS-1-78. (SE)
- Harris, L. D., and W. H. Smith.  
1978. Relations of forest practices to nontimber values and adjacent ecosystems. *IMPAC Rep.* 3(5):39. (SE)
- Hrubes, R. J., and G. Rensi.  
1977. Options for reducing "waste" in the management of old-growth forests. *J. For.* 75(11):719-721. (PSW)
- Tarrant, Robert F.  
1976. The future for hemlock: Management possibilities and research needs. Proc. West. Hemlock Conf., p. 316-317. Coll. For. Resour. Univ. Wash. (PNW)
- Weintraub, A.  
1978. A methodology for decisionmaking in project evaluation in land management planning. *In* Operational forest management planning methods: proceedings, p. 109-117. Steering Sys. Proj. Group, Int. Union For. Res. Organ. Gen. Tech. Rep. PSW-32. (PSW)

Whitmore, Jacob L.

1978. Forestry potential. *In* Vieques-1972 survey of the natural resources. Puerto Rico, Gov. Off., Environ. Quality Board, Ch. 8, p. 1-7. (SO)

Whitmore, Jacob L.

1977. Fortalecimiento del programa forestal: Paraguay. Pautas para labores de investigación forestal. FAO-UNDP. Informe Técnico No. 9. FO:DP/PAR/72/001. 40 p. (SO)

## Silviculture

### Artificial Regeneration

- Baer, Norman, Frank Ronco, and Charles W. Barney.  
1977. Effects of watering, shading, and size of stock on survival of planted lodgepole pine. U.S. Dep. Agric. For. Serv. Res. Note RM-347, 4 p. (RM)
- Barnett, James P.  
1976. Collecting and processing methods affect pine seed germinability, p. 70-72. *In* 1976 Southeast. Nurserymen's Conf. (SO)
- Barnett, James P.  
1976. Earlier collection dates for southern pine cones, p. 50-56. *In* 1976 Southeast. Nurserymen's Conf. (SO)
- Barnett, James P.  
1978. Covering affects container germination of southern pine seeds. *Tree Planters' Notes* 29(2):13-15. (SO)
- Barnett, James P.  
1978. Forest planting and seeding. *In* McGraw-Hill 1978 yearbook of science and technology, p. 185-187. McGraw-Hill Book Co., Inc., New York. (SO)
- Bonner, Franklin T.  
1976. New developments in seed processing, p. 64-68. *In* Proc. 1976 Southeast. Nurserymen's Conf. (SO)
- Bonner, Franklin T.  
1977. Equipment and supplies for collecting, processing, storing, and testing forest tree seed. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. SO-13. 35 p. (SO)



- Bonner, Franklin T.
  1977. Reforestation in Morocco. *J. For.* 75:664-665. (SO)
- Bonner, Franklin T.
  1978. Handling and storage of hardwood seeds, p. 145-152. *In* 2d Symp. Southeast. Hardwoods. (SO)
- Bonner, Franklin T.
  1978. Storage of hardwood seeds. *In* Forest genetics resource information No. 7. For. Occas. Pap. 1978/1, p. 10-17. FAO, U.N. Rome. 50 p. (SO)
- Brendemuehl, R. H.
  1978. Sand pine research update. *In* Proc. Fla. Div. For., Coop. For. Manage. Tech. Train., p. 156-165. (SE)
- Brendemuehl, R. H., and L. Mizell.
  1978. Nursery practices for Choctawhatchee sand pine. *Tree Planters' Notes* 29(1):8-11. (SE)
- Carl, C. M., Jr., and H. W. Yawney.
  1978. Fall versus spring sowing of sugar maple seed in the nursery. *Tree Planters' Notes* 28(3&4):24-26. (NE)
- Cleary, B. D., R. D. Greaves, and P. W. Owston.
  1978. Seedlings. Chap. 6. *In* Regenerating Oregon's forests, p. 65-97. Oreg. State Univ. Ext. Serv. (PNW)
- Czapowskyj, Miroslaw M.
  1977. Hybrid poplar on two anthracite coal mine spoils—ten year results. U.S. Dep. Agric. For. Serv. Res. Note NE-268. 4 p. (NE)
- Dawson, David H., and Howard M. Phipps.
  1977. Vegetative propagation of *Populus* for intensively cultured plantations, p. 8-22. *In* 4th North Am. For. Biol. Workshop Proc. (NC)
- Edgren, James W.
  1976. Seedbed density—seedling performance relationships for Douglas fir (Abstr.) p. 75. *In* 1976 western forest conference proceedings. West. For. and Conserv. Assoc. (PNW)
- Fischer, J. W., and P. W. Owston.
  1978. Effects of shade level and irrigation regime on container-grown *Abies* seedlings. (Abstr.) p. 21. *In* Am. Assoc. Advance. Sci., Pac. Div., 59th Annu. Meet. (PNW)
- Freeman, Ted, Jim Stroh, John Zasada, and others.
  1977. A revegetative guide for Alaska. Rural Develop. Counc. Publ. 2:238. Coop. Ext. Serv., Univ. Alaska, and U.S. Dep. Agric. (PNW)
- Geary, Thomas F.
  1977. Winter planting potential of four eucalypt species in south Florida. *Tree Planters' Notes* 28(3&4):14-17. (SE)
- Gendel, Steven M., Donald E. Fosket, and Jerome P. Milksche.
  1977. Increasing white ash seed germination by embryo dissection. U.S. Dep. Agric. For. Serv. Res. Note NC-220. 3 p. (NC)
- Hare, Robert C.
  1978. Effect of shoot girdling and season on rooting of slash pine. *Can. J. For. Res.* 8:14-16. (SO)
- Hilt, Donald E.
  1977. Introduction of black walnut and northern red oak seedlings in an upland hardwood forest in southeastern Ohio. U.S. Dep. Agric. For. Serv. Res. Note NE-241. 5 p. (NE)
- Janerette, C. A.
  1978. A method for stimulating the germination of sugar maple seeds. *Tree Planters' Notes* 29:7-8. (NE)
- Laird, Peter P., and R. J. Boyd.
  1977. Results of fall lifting and overwinter storage trials at the Coeur d'Alene Nursery. *In* Proc. Intermt. Nurserymen's Assoc. (INT)
- Lindquist, James L.
  1977. Plant moisture stress patterns in planted Douglas-fir: a preliminary study of the effects of crown and aspect. U.S. Dep. Agric. For. Serv. Res. Note PSW-325. 5 p. (PSW)
- Mann, William F., Jr.
  1977. Status and outlook of containerization in the South. *J. For.* 75:579-581. (SO)
- Marquis, David A.
  1977. Devices to protect seedlings from deer browsing. U.S. Dep. Agric. For. Serv. Res. Note NE-243. 7 p. (NE)
- Noble, Daniel L., Carleton B. Edminster, and Wayne D. Shepherd.
  1978. Effects of watering, treatments on germination, survival and growth of Rocky Mountain Douglas-fir. U.S. Dep. Agric. For. Serv. Res. Note RM-357. 6 p. (RM)
- Owston, Peyton W.
  - (1976). Field Survival of container-grown seedlings planted in western Oregon and western Washington. (Abstr.) p. 83. *In* Proc. 1976 West. For. Conf. West. For. and Conserv. Assoc. (PNW)
- Owston, Peyton W., and K. W. Seidel.
  1978. Container and root treatments affect growth and root form of planted ponderosa pine. *Can. J. For. Res.* 8(2):232-236, illus. (PNW)
- Owston, Peyton W., and William I. Stein.
  - (1977). Production and use of container seedlings in the West, p. 117-125. *In* Proc. Intermt. Nurserymen's Assoc. (PNW)

- Phipps, Howard M.  
1978. Rooting *Populus* cuttings in various media bound with a liquid polymer. *Plant Propag.* 24(2):11-13. (NC)
- Phipps, Howard M., Dana Belton, and Dan Netzer.  
1977. Propagating cuttings of some *Populus* clones for tree plantations. *Plant Propag.* 23(4):8-11. (NC)
- Rietveld, W. J., and Robert D. Williams.  
1978. Detection of dormancy in black walnut seedlings with the Shigo-meter and an oscilloscope technique. *In Proc. Intermt. Nurserymen's Conf.* (1977):60-72. (NC)
- Russell, Thomas E.  
1977. Planting yellow-poplar—where we stand today. *U.S. Dep. Agric. For. Serv. Gen. Tech. Rep.* SO-17. 8 p. (SO)
- Russell, Thomas E.  
1978. How to plant yellow-poplar on the Cumberland Plateau and Highland Rim. (Unnumbered publ.) (SO)
- Russell, Thomas E., and Steve Poore.  
1977. Yellow-poplar can be planted successfully in southern Highlands. *South. Lumberman* 235(2920):80-81. (SO)
- Schubert G. H.  
1977. Forest regeneration of arid lands. *In Forests for people*, p. 62-87. *Proc. Soc. Am. For. Natl. Meet.* (RM)
- Schubert, Thomas H., and José A. Zambrana.  
1978. West Indies or small-leaf mahogany: an ornamental and shade tree for semi-confined areas and adverse conditions. *U.S. Dep. Agric. For. Serv., Urban For. Bull., Caribbean Area*, 2 p. (SO)
- Schubert, Thomas H., and José A. Zambrana.  
1978. Honduras or bigleaf mahogany: an ornamental and shade tree for avenues, road intersections, and large areas. *U.S. Dep. Agric. For. Serv., Urban For. Bull., Caribbean Area*, 2 p. (SO)
- Scowcroft, Paul G.  
1978. Germination of *Sophora chrysophylla* increased by presowing treatment. *U.S. Dep. Agric. For. Serv. Res. Note* PSW-327. 6 p., illus. (PSW)
- Shoulders, Eugene.  
1977. Which to plant, loblolly or slash pine? *Tree Planters' Notes* 28(2):10-14. (SO)
- Shoulders, Eugene.  
1978. Species selection in Gulf coast states, p. 203-210. *In Proc. Symp. Soil Moisture-Site Produc.* (SO)
- Stein, William I.  
1977. Progress report from the task force on regeneration evaluation. *In 1977 western forest conference*, p. 107-108. *West For. and Conserv. Assoc.* (PNW)
- Stein, William I.  
1978. Reforestation evaluation. Chap. 11. *In Regenerating Oregon's forests*, p. 205-221. *Oreg. State Univ. Ext. Serv.* (PNW)
- Stein, William I., and Peyton W. Owston.  
1977. Containerized seedlings in western reforestation. *J. For.* 75(9):575-578. (PNW)
- Stewart, R. E.  
1978. Site preparation. Chap. 7. *In Regenerating Oregon's forests*, p. 99-129. *Oreg. State Univ. Ext. Serv.* (PNW)
- Tinus, R. W.  
1977. Production of container grown hardwoods. *In 1977 International nurserymen's association conference proceedings*, p. 126-136. *Kansas State Univ.* (RM)
- Van Deusen, James L.  
1978. Shelterbelts on the Great Plains: what's happening? *J. For.* 75(3):160-161. (RM)
- Van Haverbeke, David F.  
1977. Conifers for single-row field windbreaks. *U.S. Dep. Agric. For. Serv. Res. Pap.* RM-196. 10 p. (RM)
- Venator, Charles R., Juan E. Muñoz, and Nairam F. de Barros.  
1977. Root immersion in water; a promising method for successful bare-root planting of Honduras pine. *Turrialba* 27(3):287-291. (SO)
- Venator, Charles R., and Alberto Rodríguez.  
1977. Using styroblock containers to grow *Pinus caribaea* var. *hondurensis* Barr. & Golf. nursery seedlings. *Turrialba* 27(4):393-396. (SO)
- Wadsworth, Frank H., and Thomas H. Schubert.  
1977. Species adaptables a suelos forestales disponibles en Puerto Rico. *Revista/Review Inter-Americana* 7(2):320-332. (SO)
- Walters, Gerald A.  
1977. Moist-scale—a way to irrigate according to a plant's needs. *Tree Planters' Notes* 28(3-4):27-28. (PSW)
- Walters, Gerald A., and Donovan Goo.  
1978. Field performance of container-grown saligna eucalyptus seedlings not affected by packing/storage treatment. *Tree Planters' Notes* 29(1):30-31. (PSW)
- Walters, Gerald A.  
1978. Seedling packing box easily converts into seedling carrying box. *Tree Planters' Notes* 29(1):27-29. (PSW)

# timber management

Williams, Robert D., David T. Funk, and Rodney Nielsen.

1977. Squirrels, direct seeding walnuts, repellents. South. Lumberman 235:89-91. (NC)

Zambrana, José A., and Thomas H. Schubert.

1977. Black olive or gregre: an ornamental and shade tree for confined areas and adverse conditions. U.S. Dep. Agric. For. Serv., Urban For. Bull., Caribbean Area. 2 p. (SO)

Zasada, J. C., and R. A. Densmore.

1977. Changes in seed viability during storage for selected Alaskan Salicaceae. Seed Sci. and Tech. 5:509-518, illus. (PNW)

## Growth and Yield

Alban, David H.

1978. Growth of adjacent red and jack pine plantations in the Lake States. J. For. 76:418-421. (NC)

Barrett, James W.

1978. Height growth and site index curves for managed, even-aged stands of ponderosa pine in the Pacific Northwest. U.S. Dep. Agric. For. Serv. Res. Pap. PNW-232. 14 p., illus. (PNW)

Bartos, Dale L., and Robert S. Johnston.

1978. Biomass and nutrient content of quaking aspen at two sites in the Western United States. For. Sci. 24:273-280. (INT)

Bennett, F. A., F. T. Lloyd, B. F. Swindel, and E. W. Whitehorne.

1978. Yield of veneer and associated products from unthinned, old-field plantations of slash pine in the North Florida and South Georgia Flatwoods. U.S. Dep. Agric. For. Serv. Res. Pap. SE-176, 80 p. (SE)

Bruce, David, Donald J. DeMars, and Donald L. Reukema.

1977. Douglas-fir managed yield simulator—DFT user's guide. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PNW-57. 26 p., illus. (PNW)

Carmean, Willard H.

1978. Site index curves for northern hardwood species in northern Wisconsin and upper Michigan. U.S. Dep. Agric. For. Serv. Res. Rep. NC-160. 16 p. (NC)

Clutter, Jerome L., and Tommy R. Dell.

1978. Expected yields of pine plantations on prepared sites. p. 111-122. In Proc. Symp. Princ. maintaining produc. on prepared sites. (SO)

Crow, T. R.

1978. Biomass and production in three contiguous forests in northern Wisconsin. Ecology 59(2):269-273. (NC)

Curtis, Robert O.

1978. Growth and yield in uneven-aged stands. In Uneven-aged silviculture and management in the United States, p. 186-201. U.S. Dep. Agric. For. Serv., Timber Manage. Res., Washington, D.C. (PNW)

Edminster, Carleton B.

1978. Development of growth and yield models for dwarf mistletoe-infested stands, p. 172-177. In Proc. Symp. Dwarf Mistletoe Control through For. Manage. (RM)

Edminster, Carleton B.

1978. RMYLD: computation of yield tables for even-aged and two-storied stands. U.S. Dep. Agric. For. Serv. Res. Pap. RM-199. 26 p. (RM)

Feduccia, Donald P.

1977. Ten-year growth following thinning of slash pine planted on medium to poor cutover sites. U.S. Dep. Agric. For. Serv. Res. Note SO-137. 6 p. (SO)

Field, Richard C., J. L. Clutter, and E. P. Jones, Jr.

1978. Predicting thinning volumes for pine plantations. South. J. Appl. For. 2:59-61. (SE)

Myers, Charles, David Polak, and Les Stortz.

1977. Full tree weight equations and tables for selected central hardwoods, p. 401-407. In Proc. Central Hardwood For. Conf. (NC)

Reukema, Donald L., and David Bruce.

1977. Effects of thinning on yield of Douglas-fir: concepts and some estimates obtained by simulation. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PNW-58. 36 p., illus. (PNW)

Schlaegel, Bryce E.

1978. Growth and yield of natural hardwood stands: concepts, practices, and problems, p. 120-129. In Proc. 2d Symp. on Southeast. Hardwoods. (SO)

Williamson, R. L.

1978. Applicability of four regional volume equations for estimating growth response to thinning in Douglas-fir (Abstr. 94). In Proc. Northwest Sci. Assoc. 51st Annu. Meet. (PNW)

Zavitkovski, J., and David H. Dawson.

1978. Intensively cultured plantations. Structure and biomass production of 1- to 7-year-old tamarack in Wisconsin. TAPPI 61(6):68-70. (NC)

## Natural Regeneration

- Artley, Donald K., Raymond C. Shearer, and Robert W. Steele.  
1978. Effects of burning moist fuels on seedbed preparation in cutover western larch forests. U.S. Dep. Agric. For. Serv. Res. Pap. INT-211. 14 p. (INT)
- Benzie, John W., and Alvin A. Alm.  
1977. Red pine seedling establishment after shelterwood-strip harvesting. U.S. Dep. Agric. For. Serv. Res. Note NC-224. 3 p. (NC)
- Crouch, G. L., and Erwin Haferstein.  
1977. Atrazine promotes ponderosa pine regeneration. U.S. Dep. Agric. For. Serv. Res. Note PNW-309. 8 p. (RM)
- Farr, W. A., H. A. Smith, and B. Benizian.  
1977. Nutrient concentrations in naturally regenerated seedlings of *Picea sitchensis* in Southeast Alaska. Forestry 50(2):104-112, illus. (PNW)
- Feduccia, Donald P.  
1978. Regenerating slash pine naturally without suppression. South. J. Appl. For. 2:86-89. (SO)
- Fisch, Gordon G., and Edward J. Dimock, II.  
1978. Shoot clipping by Douglas squirrels in regenerating Douglas fir. J. Wildl. Manage. 42(2):415-418, illus. (PNW)
- Graber, R. E. and D. F. Thompson.  
1978. Seeds in the organic layers and soil of four beech-birch-maple stands. U.S. Dep. Agric. For. Serv. Res. Pap. NE-401. (NE)
- Heavilin, Danny.  
1977. Conifer regeneration on burned and unburned clearcuts on granitic soils of the Klamath National Forest. U.S. Dep. Agric. For. Serv. Res. Note PSW-321. 3 p. (PSW)
- Holt, Coleman.  
1978. The effect of deer population on natural regeneration in the Allegheny Plateau region. Allegheny News, p. 9. (NE)
- Horsley, Stephen B.  
1977. Allelopathic inhibition of black cherry II. Inhibition by woodland grass, fern, and club moss. Can. J. For. Res. 7(3):515-519. (NE)
- Horsley, Stephen B.  
1978. Allelopathic inhibition of forest regeneration. Allegheny News, Spring 1978, p. 12. (NE)
- Johnson, Robert L.  
1978. Planning for natural regeneration of hardwoods in the Coastal Plain, p. 114-119. In Proc. 2d Symp. Southeast. Hardwoods. (SO)
- Johnson, Paul S.  
1977. Predicting oak stump sprouting and sprout development in the Missouri Ozarks. U.S. Dep. Agric. For. Serv. Res. Pap. NC-149. 11 p. (NC)
- Kushmaul, Ronald J.  
1978. Site preparation for the regeneration of southern pines: problems and challenges. In Proc. South. Weed Sci. Soc. 31: 201-203. (SO)
- Lofan, James E., and David A. Perry.  
1977. Fifth-year seed: seedling ratios of lodgepole pine by habitat type and seedbed preparation technique. U.S. Dep. Agric. For. Serv. Res. Note INT-239. 6 p. (INT)
- McGee, Charles E.  
1978. Size and age of tree affect white oak stump sprouting. U.S. Dep. Agric. For. Serv. Res. Note SO-239. 2 p. (SO)
- Minore, Don, and Richard E. Carkin.  
1978. Vegetative indicators, soils, overstory canopy, and natural regeneration after partial cutting on the Dead Indian Plateau of southwestern Oregon. U.S. Dep. Agric. For. Serv. Res. Note PNW-316. 9 p., illus. (PNW)
- Noble, Daniel L., and Robert R. Alexander.  
1977. Environmental factors affecting natural regeneration of Engelmann spruce in the central Rocky Mountains. For. Sci. 23(4):420-436. (RM)
- Noble, Daniel L., and Frank Ronco, Jr.  
1978. Seedfall and establishment of Engelmann spruce and subalpine fir in clearcut openings in Colorado. U.S. Dep. Agric. For. Serv. Res. Pap. RM-200. 12 p. (RM)
- Perry, David A., and James E. Lotan.  
1977. Opening temperatures in serotinous cones of lodgepole pine. U.S. Dep. Agric. For. Serv. Res. Note INT-228. 6 p. (INT)
- Perry, David A., and James E. Lotan.  
1977. Regeneration and early growth on strip clearcuts in lodgepole pine/bitterbrush habitat type. U.S. Dep. Agric. For. Serv. Res. Note INT-238. 7 p. (INT)
- Radwan, M. A., and G. L. Crouch.  
1977. Seed germination and seedling establishment of redstem ceanothus. J. Wildl. Manage. 41(4):760-766. (PNW)
- Rietveld, W. J.  
1978. Forecasting seed crops and determining cone ripeness in south-

# timber management

- western ponderosa pine. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. RM-50. 12 p. (RM)
- Smith, H. Clay.  
1977. Height of tallest saplings in 10-year-old Appalachian hardwood clearcuts. U.S. Dep. Agric. For. Serv. Res. Pap. NE-381. 6 p. (NE)
- Tubbs, C. H.  
1977. Natural regeneration of northern hardwoods in the northern Great Lakes region. U.S. Dep. Agric. For. Serv. Res. Pap. NC-150. 20 p. (NC)
- Williamson, Richard L.  
1976. Natural regeneration of western hemlock. *In* Western Hemlock Conference proceedings. p. 166-169. Coll. For. Resour., Univ. Wash. (PNW)

## Silvicultural Methods

- Benzie, John W.  
1977. Manager's handbook for jack pine in the northcentral States. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-32. 18 p. (NC)
- Benzie, John W.  
1977. Manager's handbook for red pine in the northcentral States. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-33. 22 p. (NC)
- DeBylle, Norbert V.  
1978. Larch/Douglas-fir clearcutting and burning effects—a holistic research approach. *In* Proc. 51st Annu. Meet., p. 37. Northwest Sci. Assoc. (INT)
- DeBylle, Norbert V.  
1978. Our western aspen ecosystem—quest for management. *West. Wildlands* 4(3):18-23. (INT)
- Frank, Robert M., and Barton M. Blum.  
1978. The selection system of silviculture in spruce-fir stands—procedures, early results, and comparisons with unmanaged stands. U.S. Dep. Agric. For. Serv. Res. Pap. NE-425 (In press). (NE)
- Galea, John, J. Dean Argyie, and John Zasada.  
1976. Opportunities and limitations of northern forest types in interior Alaska. *Maine For. Rev.*:10-11. (PNW)
- Isebrands, J. G.  
1977. Short rotation silviculture as an energy source. (Abstr.) p. 18. Proc. Natl. Conf. For. Prod. Util. Res. (NC)

- Johnson, Robert L.  
1978. Hardwood culture in the eastern United States. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. PNW-70, p. 55-59. (SO)
- Johnston, William F.  
1977. Manager's handbook for black spruce in the north central States. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-34. 18 p. (NC)
- Johnston, William F.  
1977. Manager's handbook for northern white-cedar in the north central States. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-35. 18 p. (NC)
- Leak, W. B., and S. M. Filip.  
1977. Thirty-eight years of group selection in New England northern hardwoods. *J. For.* 75(10):641-643. (NE)
- Perala, Donald A.  
1977. Manager's handbook for aspen in the north central States. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-36. 30 p. (NC)
- Sander, Ivan L.  
1977. Manager's handbook for oaks in the North Central States. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-37. 35 p. (NC)
- Schlesinger, Richard C., and David T. Funk.  
1977. Manager's handbook for black walnut. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-38. 22 p. (NC)
- Smith, H. Clay, and N. I. Lamson.  
1977. Stand development 25 years after a 9.0-inch diameter-limit first cutting in Appalachian hardwoods. U.S. Dep. Agric. For. Serv. Res. Pap. NE-379. 4 p. (NE)
- Tubbs, C. H.  
1977. Manager's handbook for northern hardwoods in the north-central States. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. NC-39. 29 p. (NC)

## Site Evaluation and Soil Improvement

- Auchmoody, L. R.  
1977. Influence of mortality in evaluating forest growth responses to fertilization. (Abstr.) p. 180. *Agron. Abstr.* 1977 Annu. Meet. (NE)
- Auchmoody, L. R.  
1978. Hardwood fertilization progress: Allegheny and Appalachian areas. *Allegheny News*, p. 10-11. (NE)
- Baker, James B.  
1978. Nutrient drain associated with hardwood plantation culture,



- p. 48-53. *In Proc. 2d Symp. Southeast. Hardwoods.* (SO)
- Baker, James B., and Walter M. Broadfoot.  
1977. A practical field method of site evaluation of eight important southern hardwoods. U.S. Dep. Agric. For. Serv. Gen. Tech. Rep. SO-14. 31 p. (SO)
- Baker, James B., and Walter M. Broadfoot.  
1978. A new technique of site selection for hardwoods. *South. J. Appl. For.* 2(2):42-43. (SO)
- Baker, James B., and Walter M. Broadfoot.  
1978. Where to plant hardwoods. *For. Farmer* 37(8):7-8. (SO)
- Baker, James B., and Bobby G. Blackmon.  
1978. Summer fallowing—a simple technique for improving old-field sites for cottonwood. U.S. Dep. Agric. For. Serv. Res. Pap. SO-142. 5 p. (SO)
- Blackmon, Bobby G.  
1977. Effects of fertilizer nitrogen on tree growth, foliar nitrogen, and herbage in eastern cottonwood plantations. *J. Soil Sci. Soc. Am.* 41:992-995. (SO)
- Blackmon, Bobby G.  
1978. Soil management in hardwood plantations. p. 40-47. *In* 2d Symp. Southeast. Hardwoods. (SO)
- Cain, Michael D.  
1978. Planted loblolly and slash pine response to bedding and flat disk-ing on a poorly drained site—an update. U.S. Dep. Agric. For. Serv. Res. Note SO-237. (SO)
- Cochran, P. H.  
1977. Response of ponderosa pine 8 years after fertilization. U.S. Dep. Agric. For. Serv. Res. Note PNW-301. 7 p. (PNW)
- Francis, John K.  
1977. Fertilizer and mulch improves yellow-poplar growth on exposed Hartsells subsoils. U.S. Dep. Agric. For. Serv. Res. Note SO-231. 3 p. (SO)
- Francis, John K., and Nelson S. Loftus.  
1977. Chemical and physical properties of Cumberland Plateau and Highland Rim forest soils. U.S. Dep. Agric. For. Serv. Res. Pap. SO-138. 44 p. (SO)
- Graney, David L.  
1977. Site index predictions for red oaks and white oak in the Boston Mountains of Arkansas. U.S. Dep. Agric. For. Serv. Res. Pap. SO-139. 9 p. (SO)
- Hansen, Edward A.  
1977. Forest irrigation: a review, p. 126-137. *In Proc. Soil Moisture-Site Prod. Symp.* (NC)
- Jorgensen, J. R.  
1978. Growth of legumes on forest soils fertilized at low rates. U.S. Dep. Agric. For. Serv. Res. Note SE-251. 7 p. (SE)
- Lamson, N. I.  
1978. Fertilization increases growth of sawlog-size yellow-poplar and red oak in West Virginia. U.S. Dep. Agric. For. Serv. Res. Pap. NE-403. 6 p. (NE)
- Langdon, O. Gordon, and Glyndon E. Hatchell.  
1977. Performance of loblolly, slash, and pond pines on a poorly drained site with fertilization at ages 11 and 14. *In* South. For. Soils Workshop, 6:121-126. (SE)
- Langdon, O. Gordon, and Kenneth B. Trousdell.  
1978. Stand manipulation: effects on soil moisture and tree growth in southern pine and pine-hardwood stands, p. 221-236. *In Proc. Soil Moisture-Site Prod. Symp.* (SE)
- McKee, W. H., Jr.  
1978. Rust on iron rods indicates depth of soil water tables, p. 286-291. *In Proc. Soil Moisture-Site Prod. Symp.* (SE)
- McQuilkin, Robert A., and Robert R. Rogers.  
1978. A method for determining the precision of site index estimates made from site index prediction functions. *For. Sci.* 24(2):289-296. (NC)
- McQuilkin, Robert A.  
1978. How to estimate site index for oaks in the Missouri Ozarks. U.S. Dep. Agric. For. Serv. Leaflet 8 p. (NC)
- Miller, Richard E.  
1976. Effects of fertilization on mortality in western hemlock and Douglas-fir stands. *In* Western hemlock conference proceedings, p. 253-265. Coll. For. Resour., Univ. Wash. (PNW)
- Powers, Robert F.  
1977. Predicting site index through mineralizable soil nitrogen. (Abstr.) p. 182. *Agron. Abstr.* 69th Annu. Meet. Am. Soc. Agron. (PSW)
- Powers, Robert F., and William W. Oliver.  
1978. Site classification of ponderosa pine under stocking control in California. U.S. Dep. Agric. For. Serv. Res. Pap. PSW-128. 9 p. illus. (PSW)
- Safford, Lawrence O., and Miroslaw M. Czapowskyj.  
1977. Effect of fertilization on the soil and foliar nutrient status and growth rate of 15-year old pioneer hardwood stand in eastern Maine.

# timber management

- (Abstr.) p. 183. Agron. Abstr. 69th Annu. Meet. Amer. Soc. Agron. (NE)
- Safford, L. O., H. E. Young, and T. W. Knight.  
1977. Effect of soil and urea fertilization on foliar nutrients and basal area growth of red spruce. *Life Sci. and Agric. Exp. Stn. Bull.* 740. 27 p. (NE)
- Shoulders, Eugene, and Thomas A. Terry.  
1978. Dealing with site disturbances from harvesting, p. 85-97. *In Proc. Symp. Princ. Maintaining Product. on Prepared Sites.*(SO)
- Webster, S. R., D. S. DeBell, K. N. Wiley, and W. A. Atkinson.  
1976. Fertilization of western hemlock. *In western hemlock conference proceedings.* p. 247-252. Coll. For. Resour., Univ. Wash. (PNW)
- Wells, C. G., and J. R. Jorgensen.  
1978. Nutrient cycling in loblolly pine—silvicultural implications. *TAPPI* 61(1):29-32. (SE)

## Stand Improvement

- Burns, Russell M., and R. H. Brendenmuhl.  
1978. Sand pine; early responses to row thinning. *U.S. Dep. Agric. For. Serv. Res. Note* SE-262. 8 p. (SE)
- Gratkowski, H.  
1977. Site preparation and conifer release in Pacific Northwest forests. *In 27th annual weed conference proceedings.* p. 29-32. Wash. State Weed Assoc. (PNW)
- Gratkowski, H. J.  
1978. Annual variation in effect of 2,4-D and 2,4,5-T on ponderosa pine. *For. Sci.* 24(2):281-287, illus. (PNW)
- Gratkowski, H. J., R. E. Stewart, and H. G. Weatherly.  
1978. Triclopyr and Krentle herbicides show promise for use in Pacific Northwest forests. *Down to Earth* 34(3):28-31, illus. Dow Chemical Co. (PNW)
- Grisez, Ted J.  
1978. Pruning black cherry in understocked stands. *U.S. Dep. Agric. For. Serv. Res. Pap.* NE-395. 9 p. (NE)
- Hilt, Donald E., Francis R. Herman, and John F. Bell.  
1977. A test of commercial thinning on the Hemlock Experimental Forest. *U.S. Dep. Agric. For. Serv. Res. Pap.* PNW-225. 11 p., illus. (PNW)

- Houston, Douglas W., and Roger M. Krinard.  
1978. Evaluation of herbicides for cottonwood culture. (Abstr.) *In Proc., South. Weed Sci. Soc.* 31:196. (SO)
- Jones, Earle P., Jr.  
1977. Precommercial thinning of naturally seeded slash pine increases volume and monetary returns. *U.S. Dep. Agric. For. Serv. Res. Pap.* SE-164. 12 p. (SE)
- Lamson, Neil I., and H. Clay Smith.  
1978. Response to crop-tree release: sugar maple, red oak, black cherry, and yellow-poplar saplings in a 9-year-old stand. *U.S. Dep. Agric. For. Serv. Res. Pap.* NE-394. 8 p. (NE)
- Lofitis, David L.  
1978. Preharvest herbicide control of undesirable vegetation in Southern Appalachian hardwoods. *South. J. Appl. For.* 2(2):51-54. (SE)
- Schmidt, Wyman C.  
1977. Some biological and physical responses to forest stand density. *In Proc. 1976 West. For. Conf., West. For. & Cons. Assoc., Executive Sum.,* p. 89. (INT)
- Snigo, Alex L., Nelson F. Rogers, E. Allen McGinnes, Jr., and David T. Funk.  
1978. Black walnut on Kansas strip mine spoils: some observations 25 years after pruning. *U.S. Dep. Agric. For. Serv. Res. Pap.* NE-393. 14 p. (NE)
- Smith, H. Clay.  
1977. Results of precommercial thinning in very young Appalachian hardwood stands. *North. Logger* 26(6):24-25. (NE)
- Stewart, R. E.  
1977. Ammonium thiocyanate does not increase herbicidal control of salmonberry. *U.S. Dep. Agric. For. Serv. Res. Note* PNW-308. 6 p. (PNW)

## Special Products

- Amburgey, Terry L., Fairie Lyn Carter, and Donald R. Roberts.  
1978. Resistance of wood from paraquat-treated southern pine trees to termites and the fungus *Gloeophyllum trabeum*. *Wood Sci.* 10(4):187-192. (SE)
- Beers, Walter L., Jr.  
1978. First standard LRCC study: procedures. *In Proc. Lightwood Res.*

- Coord. Counc. Annu. Meet. 1978:94-95. (SE)
- Clements, Ralph W.  
1977. New plastic cup for the gum naval stores industry. U.S. Dep. Agric. For. Serv. Res. Note SE-258. 4 p. (SE)
- Conner, Anthony H., Marilyn A. Diehl, Hanna Wroblewska, and John W. Rowe.  
1977. Effects of paraquat treatment of northern and western conifers. *In* Proc. Lightwood Res. Coord. Counc. Annu. Meet. 1977:34-56. (SE)
- Draper, Lee, Jr.  
1978. First standard LRCC study: results. *In* Proc. Lightwood Res. Coord. Counc. Annu. Meet. 1978:96-100. (SE)
- Ericksen, William D.  
1978. First standard LRCC study—loblolly pine in Nassau County, Fla. *In* Proc. Lightwood Res. Coord. Counc. Annu. Meet. 1978:105-109. (SE)
- Gabriel, W. J., and D. W. Seegrist.  
1977. Differences in sugar content of sugar maple sap in northeastern United States. *Nat. Maple Syrup Dig.* 16(3):8-10. (NE)
- Gansel, Charles R.  
1977. Crown shaping in a slash pine seed orchard. *In* Proc. South. For. Tree Improv. Conf. 14:144-151. (SE)
- Krumbein, J. P.  
1978. An economic evaluation of the paraquat application for oleoresin production in conifers. *In* Proc. Lightwood Res. Coord. Counc. Annu. Meet. 1978:168-178. (SE)
- McBride, J. J., Jr.  
1978. Chemical analyses of the extractives from the Lightwood Research Coordinating Council efficacy study. *In* Proc. Lightwood Res. Coord. Counc. Annu. Meet. 1978:157-167. (SE)
- Parker, B. L., R. S. Walters, H. B. Teillon, and C. M. Boulanger.  
1977. Carbaryl residues in sugar maple sap. *J. Econ. Ent.* 70(6):785-788. (NE)
- Peters, William J., Donald R. Roberts, and John W. Munson.  
1978. Ethrel-diquat-paraquat interaction in lightwood formation. *In* Proc. Lightwood Res. Coord. Counc. Annu. Meet. 1978:31-39. (SE)
- Roberts, Donald R., and William J. Peters.  
1978. Status of lightwood induction technology. *Nav. Stores Rev.* Jan.-Feb. 1978:4-5, 11. (SE)
- Roberts, Donald R.  
1978. New Tool for paraquat application. *In* Proc. Lightwood Res. Coord. Counc. Annu. Meet. 1978:66-67. (SE)
- Sheikh, Mahmood Iqbal, and Ralph W. Clements.  
1977. Resin production with American chemical stimulation methods on *Pinus roxburghii*. *Nav. Stores Rev.* 87(5):4-5. (SE)
- Squillace, A. E., and E. Moyer.  
1978. Short method for estimating increases in wood extractives from induction treatments. *In* Proc. Lightwood Res. Coord. Counc. Annu. Meet. 1978:40-49. (SE)
- Squillace, A. E.  
1978. Paraquat treatment reduces wood density after alcohol-benzene extraction. *In* Proc. Lightwood Res. Coord. Counc. Annu. Meet. 1978:50-53. (SE)
- Stubbs, Jack.  
1978. Large scale field testing of paraquat application techniques. *In* Proc. Lightwood Res. Coord. Counc. Annu. Meet. 1978:116-123. (SE)
- Stubbs, Jack, and Donald R. Roberts.  
1978. A status report of the USFS production of wood chemicals research work unit. *In* Proc. Lightwood Res. Coord. Counc. Annu. Meet. 1978:205-209. (SE)
- Toffaletti, J. P.  
1978. Report on registration of the use of paraquat C1 for resin soaking in pines. *In* Proc. Lightwood Res. Coord. Counc. Annu. Meet. 1978:202-204. (SE)
- Walters, R. S.  
1978. Coniferous understory influences sugar maple (*Acer saccharum* Marsh.) sap production. U.S. Dep. Agric. For. Serv. Res. Pap. NE-398. (NE)
- Walters, R. S., and H. W. Yawney.  
1978. Plastic tubing and maple syrup quality. U.S. Dep. Agric. For. Serv. Res. Pap. NE-409. (NE)
- Walters, R. S., and A. L. Shigo.  
1978. Discolouration and decay associated with paraformaldehyde treated tapholes in sugar maple. *Can. J. For. Res.* 8:54-60. (NE)
- Wroblewska, Hanna, Anthony H. Conner, John W. Rowe, and others.  
1978. Paraquat-induced lightwood in two European conifers—scotch pine and Norway spruce. *Wood Sci.* 10(4):181-186. (SE)

# FOREST SERVICE - U.S. DEPARTMENT OF AGRICULTURE FOREST AND RANGE EXPERIMENT STATIONS, FOREST PRODUCTS LABORATORY

**LEGEND**

- ★ NATIONAL HEADQUARTERS
- EXPERIMENT STATION HEADQUARTERS
- ▲ FOREST PRODUCTS LABORATORY
- ◻ RESEARCH PROJECT LOCATIONS

**PACIFIC NORTHWEST**

- WASH. SEATTLE
- OREG. PORTLAND
- OREG. CORVALLIS
- OREG. LA GRANDE
- OREG. BEND
- OREG. ASTORIA
- OREG. TONGUE
- OREG. ASTORIA
- OREG. TONGUE

**PACIFIC SOUTHWEST**

- CALIF. BERKELEY
- CALIF. DAVIS
- CALIF. REDDING
- CALIF. OROVILLE
- CALIF. FRESNO
- HAWAII. HONOLULU
- HAWAII. KAUAI
- HAWAII. OAHU
- HAWAII. MAUI
- HAWAII. KAUAI
- HAWAII. OAHU
- HAWAII. MAUI

**INTER MOUNTAIN**

- MONT. MISSOULA
- NEV. BOZEMAN
- NEV. BILLINGS
- NEV. (SEAM)
- NEV. LOGAN
- NEV. OGDEN
- NEV. BOISE
- NEV. IDAHO
- NEV. RENO
- NEV. TUCSON
- NEV. FLAGSTAFF
- NEV. TEMPE
- NEV. ALBUQUERQUE
- NEV. LUBBOCK
- NEV. FORT COLLINS
- NEV. LARABIE
- NEV. RAPID CITY
- NEV. LINCOLN
- NEV. S.D.
- NEV. BOTTINEAU
- NEV. GRAND RAPIDS
- NEV. DULUTH
- NEV. ST. PAUL
- NEV. MADISON
- NEV. EATON
- NEV. LANSING
- NEV. MARQUETTE
- NEV. Houghton
- NEV. GRAND RAPIDS
- NEV. DULUTH
- NEV. ST. PAUL
- NEV. MADISON
- NEV. EATON
- NEV. LANSING
- NEV. MARQUETTE
- NEV. Houghton

**NORTH CENTRAL**

- NEV. ST. PAUL
- NEV. MADISON
- NEV. EATON
- NEV. LANSING
- NEV. MARQUETTE
- NEV. Houghton
- NEV. GRAND RAPIDS
- NEV. DULUTH
- NEV. ST. PAUL
- NEV. MADISON
- NEV. EATON
- NEV. LANSING
- NEV. MARQUETTE
- NEV. Houghton

**NORTHEASTERN**

- NEV. ST. PAUL
- NEV. MADISON
- NEV. EATON
- NEV. LANSING
- NEV. MARQUETTE
- NEV. Houghton
- NEV. GRAND RAPIDS
- NEV. DULUTH
- NEV. ST. PAUL
- NEV. MADISON
- NEV. EATON
- NEV. LANSING
- NEV. MARQUETTE
- NEV. Houghton

**SOUTHERN**

- NEV. ST. PAUL
- NEV. MADISON
- NEV. EATON
- NEV. LANSING
- NEV. MARQUETTE
- NEV. Houghton
- NEV. GRAND RAPIDS
- NEV. DULUTH
- NEV. ST. PAUL
- NEV. MADISON
- NEV. EATON
- NEV. LANSING
- NEV. MARQUETTE
- NEV. Houghton

**SOUTHEASTERN**

- NEV. ST. PAUL
- NEV. MADISON
- NEV. EATON
- NEV. LANSING
- NEV. MARQUETTE
- NEV. Houghton
- NEV. GRAND RAPIDS
- NEV. DULUTH
- NEV. ST. PAUL
- NEV. MADISON
- NEV. EATON
- NEV. LANSING
- NEV. MARQUETTE
- NEV. Houghton

**PACIFIC ISLANDS FORESTRY**

- NEV. ST. PAUL
- NEV. MADISON
- NEV. EATON
- NEV. LANSING
- NEV. MARQUETTE
- NEV. Houghton
- NEV. GRAND RAPIDS
- NEV. DULUTH
- NEV. ST. PAUL
- NEV. MADISON
- NEV. EATON
- NEV. LANSING
- NEV. MARQUETTE
- NEV. Houghton

## RESEARCH HEADQUARTERS

FPL	Forest Products Laboratory North Walnut Street P.O. Box 5130 Madison, Wi. 53705		PSW	Pacific Southwest Forest and Range Experiment Station 1960 Addison Avenue P.O. Box 245 Berkeley, Calif. 94701
INT	Intermountain Forest and Range Experiment Station 507 25th Street Ogden, Utah 84401		RM	Rocky Mountain Forest and Range Experiment Station 240 West Prospect Street Fort Collins, Colo. 80521
NC	North Central Forest Experiment Station 1992 Folwell Avenue St. Paul, Minn. 55108		SE	Southeastern Forest Experiment Station Post Office Building, P.O. Box 2570 Asheville, N.C. 28802
NE	Northeastern Forest Experiment Station 370 Reed Road Broomall, Pa. 19008		SO	Southern Forest Experiment Station T-10210 Federal Building 701 Loyola Avenue New Orleans, La. 70113
PNW	Pacific Northwest Forest and Range Experiment Station 809 NE 6th Avenue P.O. Box 3141 Portland, Oreg. 97208		WO	Forest Service U.S. Department of Agriculture P.O. Box 2417 Washington, D.C. 20013



JUL 26 1919

CLARK